

AMS ADVANTAGE[®] 3

Application Development

Basic Immersion Course with Hands-on
Sessions



Objectives for the Week

- Provide introduction to the AMS ADVANTAGE[®] 3 application development environment
- Review development phases with emphasis on the ADVANTAGE Studio
- Focus on business rules development, maintenance using the ADVANTAGE Studio and custom codes

You won't be fluent in a week... like anything else, that will take practice and patience



This Week's Agenda

- Day 1
 - Overview of Versata
 - Detailed tour of the development environment
 - Walk through of business objects
- Day 2
 - Development and Deployment of business objects
 - Database script generation
 - VLS Console explanation
- Day 3
 - Development and Deployment of applications (HTML generation)
 - Directory structure review



Introductions

- Name
- Project
- Current Knowledge
- Class Expectations



AMS ADVANTAGE[®] 3

Application Development

Day 1: Introduction to Application
Development in AMS ADVANTAGE[®] 3
Using the ADVANTAGE Studio



Objectives for the Day

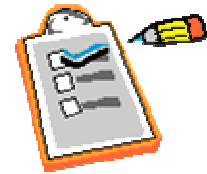
- Gain a general working knowledge of the development studio
- Gain an understanding of the repository directory structure
- Learn how to build and compile code in the development Studio
- Learn how to deploy to the application server
- Learn how to deploy to the database server
- Use the ADVANTAGE Studio to create a Business Object



Today's Agenda

Morning

- Introduction to AMS ADVANTAGE® 3 Development
- ADVANTAGE Repository
- Data Objects and Query Objects
- Development Studio



Afternoon

- Directory Structure
- Data Object/Database deployment
- 👤 ● Question and answer
- Recap

AMS ADVANTAGE[®] 3 Development Overview

AMS ADVANTAGE[®] 3
Application Development



Development Cycle Overview

- Requirements/Design
 - Define data model and business rules
- Develop
 - ADVANTAGE Studio
 - Create/modify business objects
 - Create HTML pages
- Deploy
 - Move Objects and Pages from ADVANTAGE Studio to ADVANTAGE Application
 - Compile and deploy 100% Java business objects within the business logic server environment



ADVANTAGE Development Studio

- ADVANTAGE Development Studio is the primary development tool used
- Provides an easy to use GUI to define basic Data Object structures and rules
- Produces XML that can be modified and built into Java code
- Compiles Java code to Class files



Versata in the Application

AMS ADVANTAGE - Microsoft Internet Explorer provided by AMS

AMS ADVANTAGE

Welcome, System Admin

Security Administration Application Administration Approval Administration

Message Center

Search

Page Search

Document Catalog

Report Search

History

Favorites

Administration

Application Page Registration

Menu

Page Code	Description	UI Package	Dest Page	Category	Page Type
✓ ADVAPPPG	ADVANTAGE application single signon	Advantage	AMSSSOAppPage	Infrastructure	Reference Tables
ALRT	Alerts	Advantage	piN_ALERTS_Grid	Infrastructure	Reference Tables
APGS	Application Pages	Advantage	PagesCustomize	Infrastructure	Reference Tables
APCTRL	Application Parameters	Advantage	piN_APP_CTRL	Infrastructure	Reference Tables
APPLIST	Application List	SecurityAdmin	pR_SC_APPL	Infrastructure	Reference Tables
APPSRV	Application Servers	Reports_Sys_Admin_App	Edit_AppServer_List	Infrastructure	Reference Tables
AUDCTRL	Setup Audit Log Control	Advantage	AuditLogCtrl	Infrastructure	Reference Tables
BATCTRL	Job Server Control	Reports_Sys_Admin_App	Admin_Panel1	Infrastructure	Reference Tables
BATJOBS	View All Batch Jobs	Reports_Sys_Admin_App	View_All_Jobs	Infrastructure	Reference Tables
BATRUN	Run Batch	Reports_Sys_Admin_App	RunBatch	Infrastructure	Reference Tables

First Prev Next Last

Save Undo Delete Insert Copy Paste Search

Page Code: ADVAPPPG

Category: Infrastructure

Page Type: Reference Tables

Description: ADVANTAGE application

UI Package: Advantage

Application: Common Application

Dest Page: AMSSSOAppPage

Dest Frameset:

Dest Frame:

Target Frame: Display

Help Sub Directory: Help Sub Directory

Help File Name:

Initial Mode: Browse

Order By:

Where Clause:

Searchable?: ☐

Organization Codes

AMS

Done

Local intranet

Versata in the Application

```
TextPad - [C:\AMSADV3\dev\advantage\Source\ClientApps\HTMLApps\Advantage.app\PagesCustomize.htm]
File Edit Search View Tools Macros Configure Window Help

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN" "http://www.w3.org/TR/REC-html40/loose.dtd">
<html lang="en">
<head>
<title>Application Page Registration</title>
<base href>
<link type="text/css" rel="stylesheet" href="../../AMSIImages/ADVStyle.css">
<link type="text/css" rel="stylesheet" href="../../AMSIImages/ADVMenuStyle.css">
<link type="text/css" rel="stylesheet" href="../../AMSIImages/ADVAppStyle.css">
<script type="text/javascript" language="JavaScript" vsscript="true"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSTab.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSFmtFld.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSDHTMLLib.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSUtils.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSMenuArray.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSMenu.js"></script>
<script type="text/javascript" language="JavaScript" src="../../AMSJS/AMSCalendar.js"></script>
<vtext vds=" " name="InitPageTransaction" vspreservetag="true">
</head>
<body class="ADV RefTable">
<verror>
<form action="Advantage" method="post" vsform="true" name="PagesCustomize">
<input type="hidden" name="ExpandedSections" value="">
<input type="hidden" name="AMSPageVersNo" value="">
<input type="hidden" name="refreshScalar" value="">

<div vds=" " id="MsgDisplay" name="MsgDisplay" title="Messages" vsvisible="true" ams_type="msg_disp" class="ADVMsgDisplay">
<vtext name="MsgDispContent" vds=" " vspreservetag="true">
</div>

<div name="PageContent" id="PageContent" class="ADVPGCont">

<h1 class="ADVPageTitle">
<vstitle vstitle="Application Page Registration">Application Page Registration</vstitle>
</h1>
<div class="ADVHdrActns">

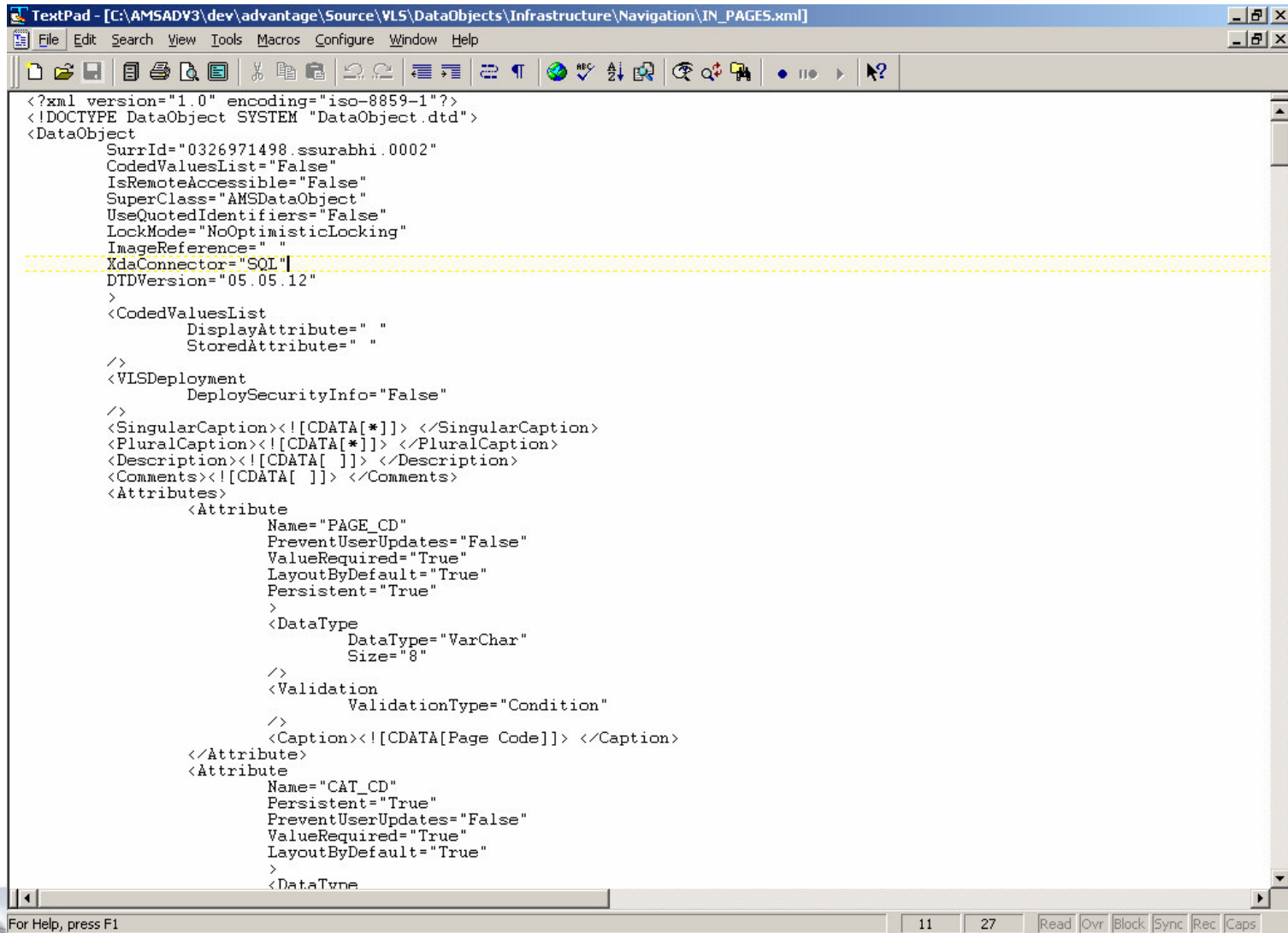
<vtext vds=" " name="PopupMenuLink" vspreservetag="true">
</div>

<a name="T1IN_PAGES_Top"></a>

<input type="hidden" name="T1IN_PAGES_Currency" value="">
</body>
</html>
```

File: PagesCustomize.htm, 20293 bytes, 524 lines, PC, ANSI

Versata in the Application



```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE DataObject SYSTEM "DataObject.dtd">
<DataObject
  SurrId="0326971498.ssurabhi.0002"
  CodedValuesList="False"
  IsRemoteAccessible="False"
  SuperClass="AMSDataObject"
  UseQuotedIdentifiers="False"
  LockMode="NoOptimisticLocking"
  ImageReference=" "
  XdaConnector="SQL"
  DTDVersion="05.05.12"
>
  <CodedValuesList
    DisplayAttribute=" "
    StoredAttribute=" "
  />
  <VLSDeployment
    DeploySecurityInfo="False"
  />
  <SingularCaption><![CDATA[*]]> </SingularCaption>
  <PluralCaption><![CDATA[*]]> </PluralCaption>
  <Description><![CDATA[ ]]> </Description>
  <Comments><![CDATA[ ]]> </Comments>
  <Attributes>
    <Attribute
      Name="PAGE_CD"
      PreventUserUpdates="False"
      ValueRequired="True"
      LayoutByDefault="True"
      Persistent="True"
    >
      <DataType
        DataType="VarChar"
        Size="8"
      />
      <Validation
        ValidationType="Condition"
      />
      <Caption><![CDATA[Page Code]]> </Caption>
    </Attribute>
    <Attribute
      Name="CAT_CD"
      Persistent="True"
      PreventUserUpdates="False"
      ValueRequired="True"
      LayoutByDefault="True"
    >
      <DataType
```

Versata in the Application

BATCTRL	Job Server Control	Reports_Sys_Admin_App	Admin_Panel
BATJOBS	View All Batch Jobs	Reports_Sys_Admin_App	View_All_Job
BATRUN	Run Batch	Reports_Sys_Admin_App	RunBatch

First Prev Next Last

Save Undo Delete Insert Copy Paste Search

Page Code: ADVAPPPG

Category: Infrastructure

Page Type: Reference Tables

Description: ADVANTAGE application

UI Package: Advantage

Application: Common Application

Dest Page: AMSSSOAppPage

Dest Frameset:

Help Sub Directory:

Help File Name:

Initial Mode: Browse

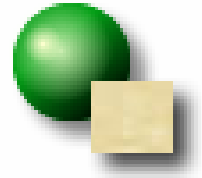
Order By:

Where Clause:

```
<Attribute
  Name="PAGE_CD"
  PreventUserUpdates="False"
  ValueRequired="True"
  LayoutByDefault="True"
  Persistent="True"
>
<DataType
  DataType="VarChar"
  Size="8"
/>
<Validation
  ValidationType="Condition"
/>
<Caption><![CDATA[Page Code]]> </Caption>
</Attribute>
```

Data Objects

- Use XML to define database structure
- Defines the physical data structures
- Typically maps to database tables
- Contains defined rules
- Could be related to other data objects
- Consists of attributes
 - Similar to database columns or data elements
 - Defines a certain data type (e.g., number, date)
 - Rules can be assigned
 - Could be “persistent”: physically stored
 - Could be “non-persistent”: calculated/derived



Query Objects

- Represents a SQL query to be executed at run time
- Similar to Data Objects, contains attributes
 - Columns queries will read or write to (the Query Object is misleading)
 - Potentially from multiple data objects
 - Persistent and non-persistent

A Peek At the ADVANTAGE Studio: Data Objects and Business Rules

The screenshot displays the ADVANTAGE Studio interface, specifically the Business Rules Designer for the R_APPR data object. The left pane shows a tree of data objects, with R_APPR expanded to show attributes like FY, APPR_CD, APPR_NM, APPR_SH_NM, APPR_DSCR, CNTAC_CD, CNTAC_PERSN, CNTAC_PH_NO, CNTAC_EMAIL_AD, ACT_FL, ALW_BUD_FL, EFBGN_DT, EFEND_DT, APCLS_CD, APCAT_CD, APTYP_CD, APGRP_CD, and CNTAC_PH_EXT. The right pane shows the Business Rules Designer for R_APPR, with the Validation tab selected. It displays a table of attributes and their validation rules, and a detailed view for the APPR_CD attribute showing a 'Condition' validation type and a 'Text' data type.

Business Rules Designer - R_APPR

Attributes Relationships Constraints Actions Properties

Name	Derivation	Validation
FY		Required
APPR_CD		Required
APPR_NM		Required
APPR_SH_NM		Required
APPR_DSCR		
CNTAC_CD		

Derivation Validation / Data Type Presentation Notes Extended

Validation Type

☒ Condition

☐ Coded Values List

Validation Condition

Validation Error

<System Supplied>

Data Type Text

Sub Type Variable Length

Size 9

☒ Value Required

☐ Prevent User Updates

Objects Files

APPR_CD Click to change Attribute and/or to edit derivation or validation

Data Object Properties

- Different types of rules can be defined
 - Attributes
 - Derivations
 - Validations
 - Presentation
 - Relationships
 - Referential integrity
 - Constraints
 - Actions/events
 - Properties
 - Keys/Indexes
- Rules are stored in an XML-based repository

A Peek At the ADVANTAGE Studio: Data Objects and Business Rules

The screenshot displays the ADVANTAGE Studio Business Rules Designer. On the left, a tree view shows a hierarchy of data objects under 'R_APPR', including attributes like 'FY', 'APPR_CD', 'APPR_NM', and 'CNTAC_CD'. The main workspace is titled 'Business Rules Designer - R_APPR' and contains a table of constraints. The 'Effective Date Comp' constraint is selected, showing its condition and configuration options.

Name	Type	Condition
Effective Date Comp	Reject When	(Inserting OR Updating) AND (EFBGN_DT IS NOT

Constraint Name: Effective Date Compare

Condition: (Inserting OR Updating) AND (EFBGN_DT IS NOT NULL AND EFEND_DT < EFBGN_DT)

☐ Accept When

☒ Reject When

Error Message: The effective end date must be greater than or equal to the begin date

Error Attribute: EFEND_DT

It's all in the Rules

- Rapid development of business rules without traditional coding (no COBOL, no C)
 - Java may be needed in special cases
- Java is generated from XML through business rules during build/rebuild
- Visual development of rules through the ADVANTAGE Development Studio
 - Based on Versata Studio, which is embedded into AMS ADVANTAGE[®] 3

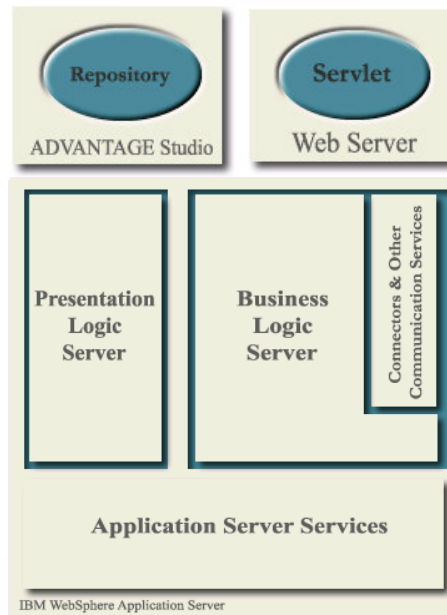
Typical Application Developer's Environment

Application Developer's Workstation



Windows NT Workstation

- ADVANTAGE Studio
- App Server Environment



Development/Test Server(s)

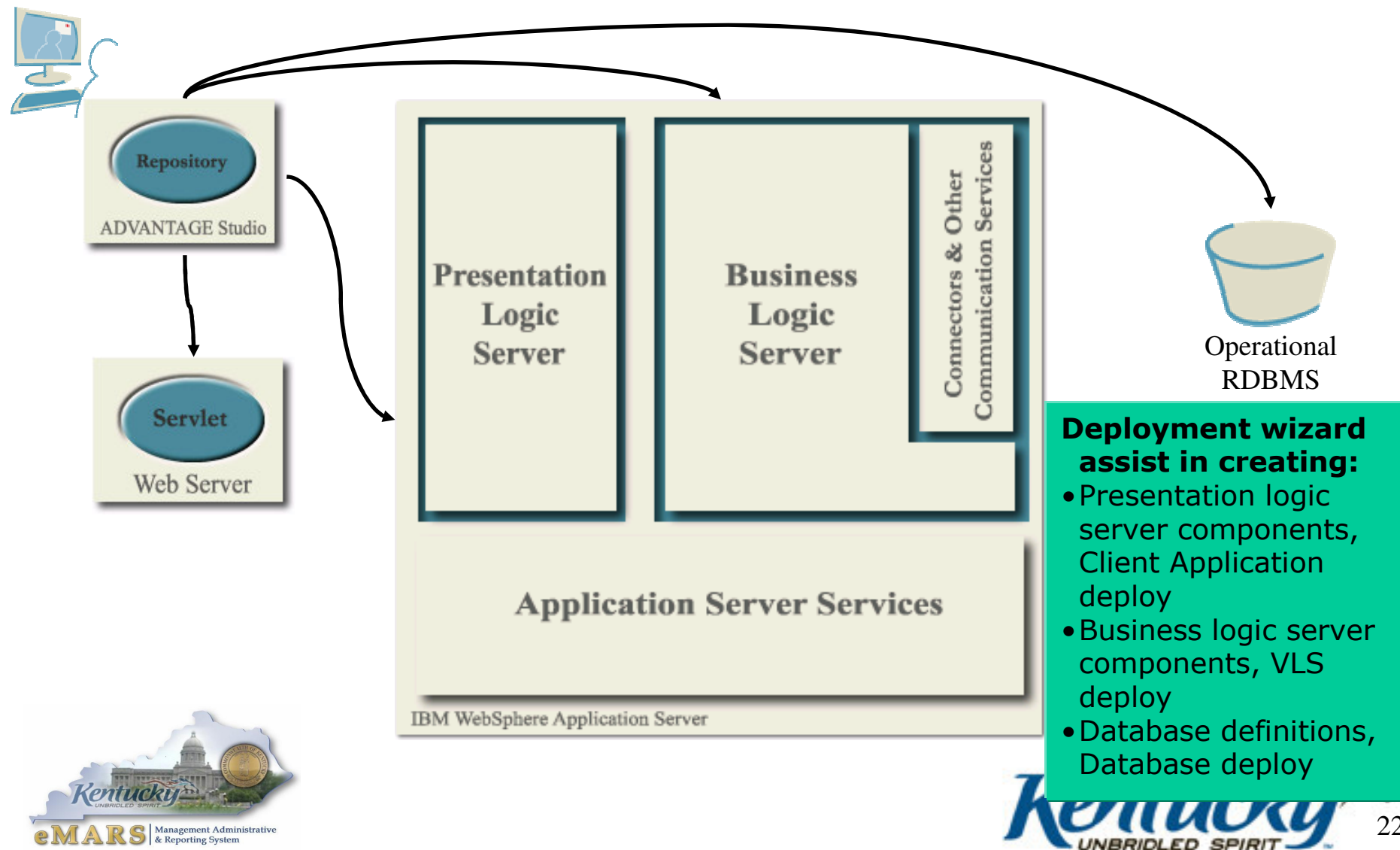


WinNT Server, Unix, etc.

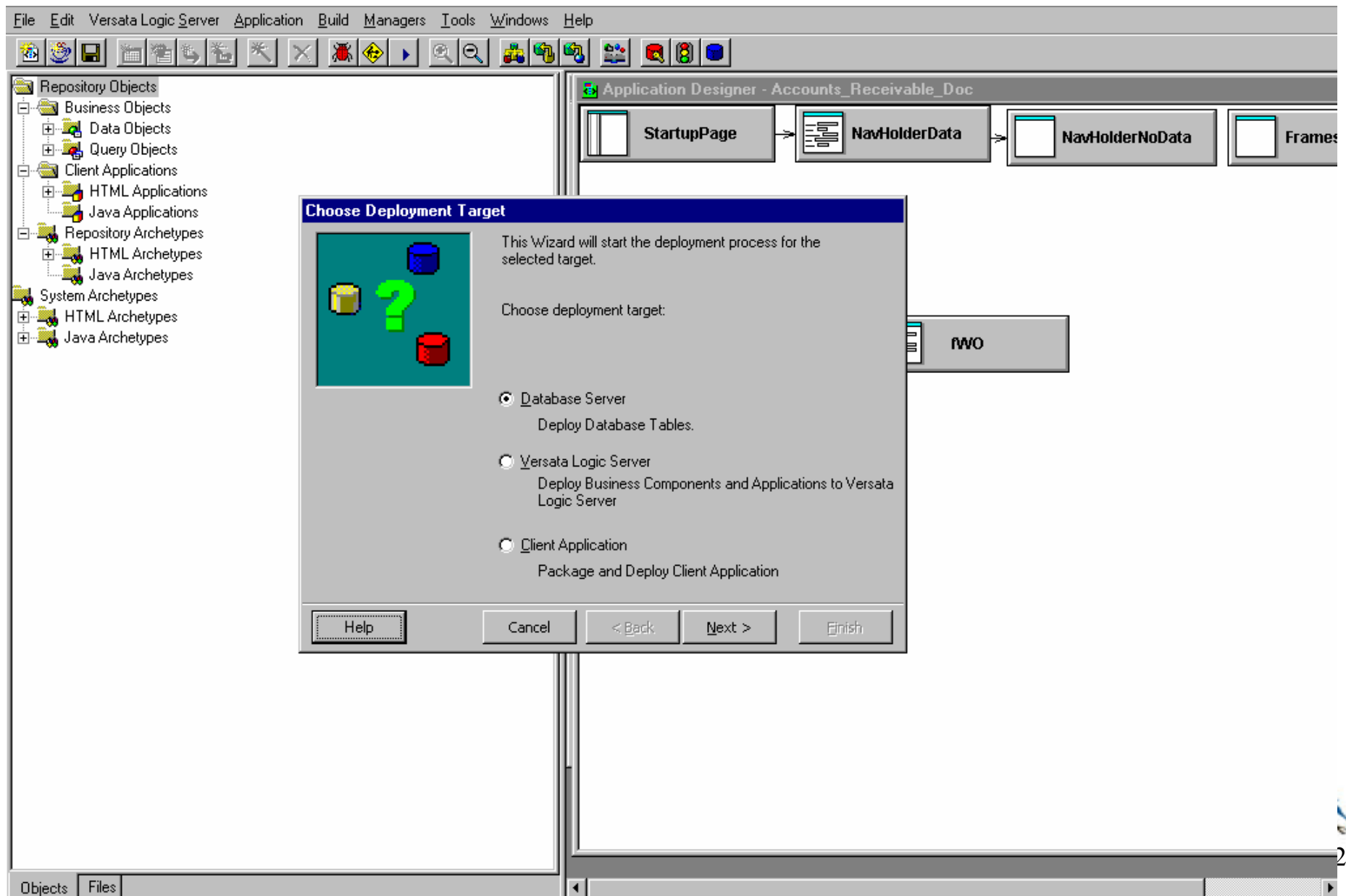
- Development/Test DBMS
- Version Management



Application Components Are Developed, Maintained and Deployed from the ADVANTAGE Studio



A Peek At the ADVANTAGE Studio: Deployment Wizard



ADVANTAGE Design Studio



Walkthrough

Break

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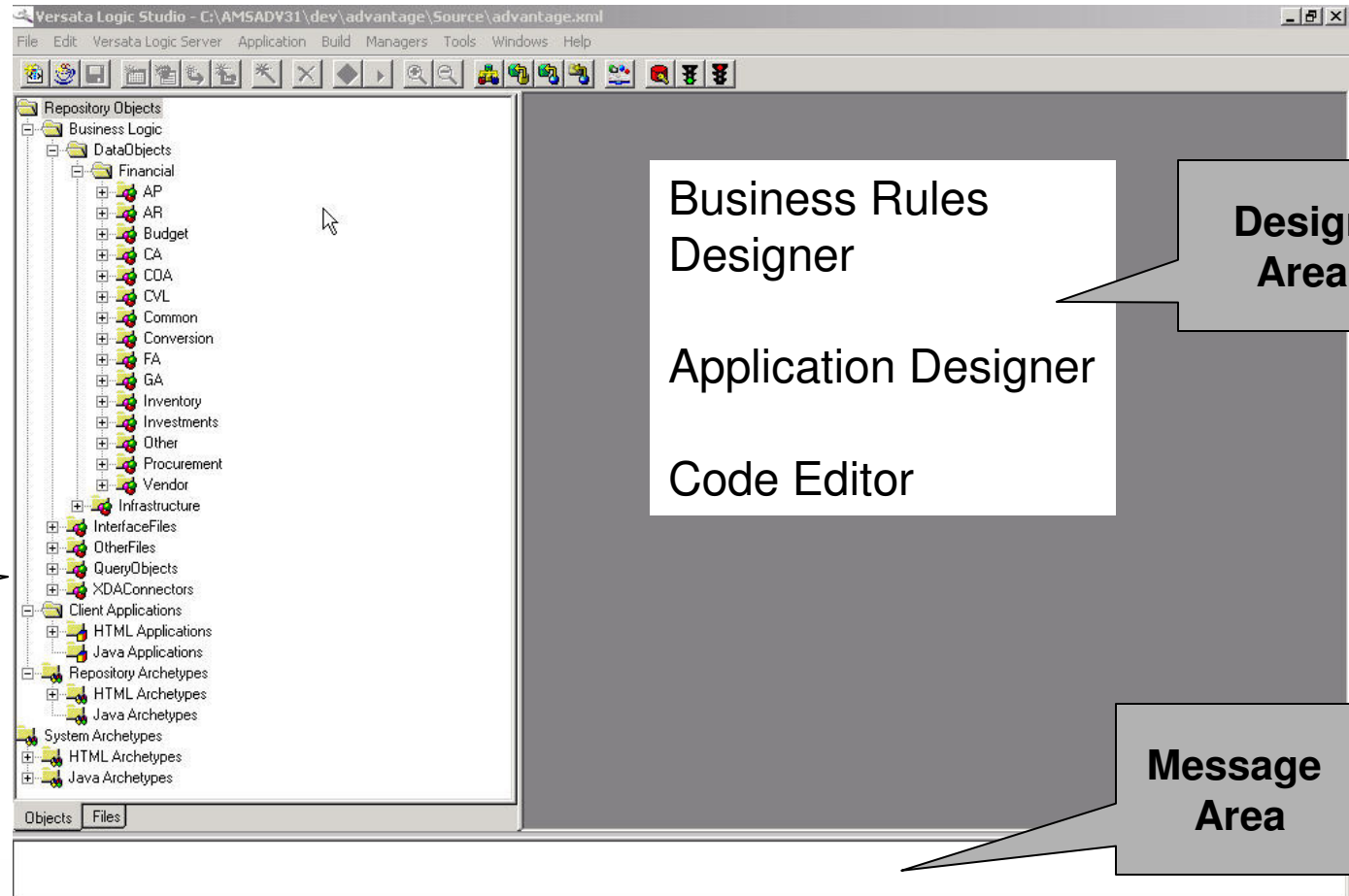


Development Studio

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Development Studio



Repository Objects

Business Objects

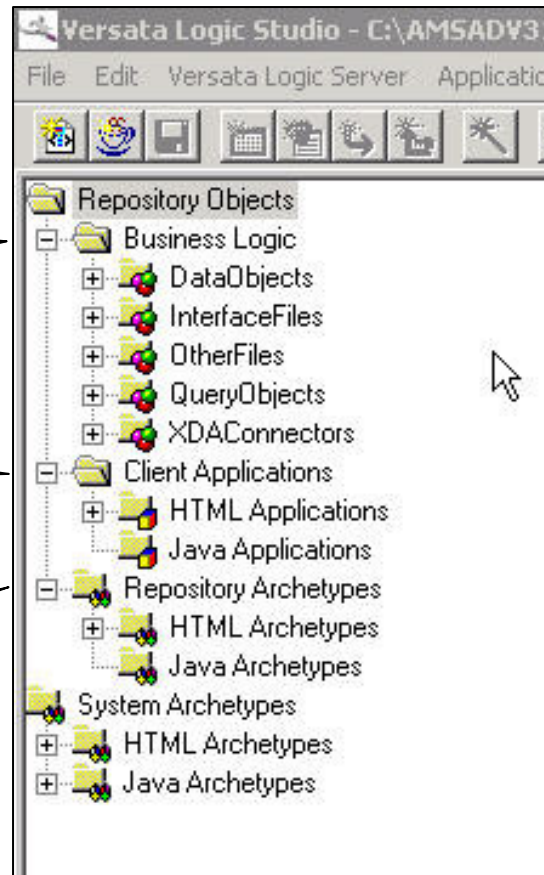
- Data Objects
- Interface Files
- Other Files
- Query Objects
- XDA Connectors

Client Applications

- HTML Applications

Archetypes

- HTML Archetypes



Repository Objects

4 Primary types of objects in ADVANTAGE

- Data Objects
- Query Objects
- Pages (Includes documents, reference pages, activity folders)
- 'OTHER FILES' Java Programs

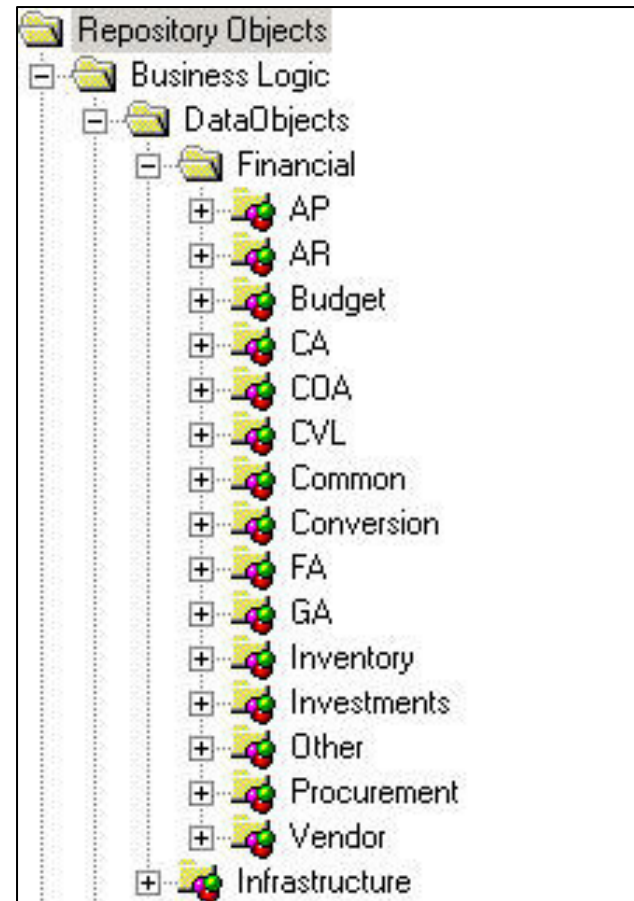
Repository Subfolders

Objects are further broken down by type and subsystem.

AP – Accounts Payable

COA – Chart of Accounts

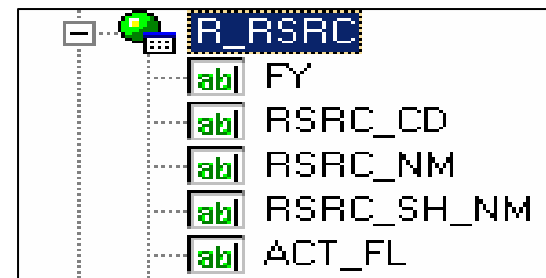
FA – Fixed Assets



Business Objects – Data Objects

Data Objects

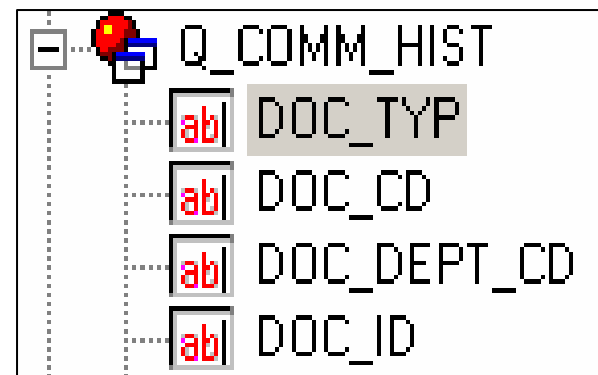
- Represents the structure of a physical data store
- Contains ‘attributes’ that will hold data about a data object
- Attributes are analogous to columns
- Attributes may be persistent (physically stored) or non-persistent (calculated at run-time based on business logic)
- Grouped together by application



Business Objects – Query Objects

Query Objects

- Represents an SQL query to be executed at runtime
- Used for joins of data objects
- Contains ‘attributes’ that are from the joined data objects or are calculated at runtime



Data Objects vs. Query Objects

- Similarities
- **File Structure** (5 primary files for every DO or QO)
 - *.XML Source file – Master file
 - *.BasImpl.java Rebuilt file – Versata generated java code after (REBUILD)
 - **Note: Never manually modified**
 - *.Impl.java Source file – Custom java code
 - *.BasImpl.class Executable file created after BasImpl.java (COMPILE)
 - *.Impl.class Executable file created after Impl.java (COMPILE)
- Differences
- A **Data Object** is a physical table in the database...while a **Query Object** is not stored in the database.

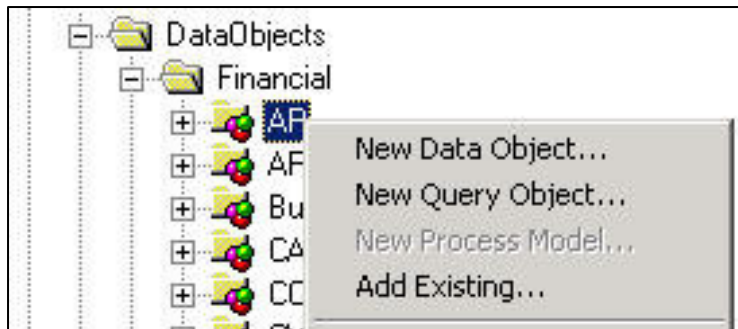
Additional file

- Versata also creates an additional *.java file (ex R_DEPT.java) – this file is NOT used
 - Located in AMSADV3\devadvantage\local
 - Informational java file produced by Versata
 - Representation of Base + Impl
 - No executable for this file used at runtime

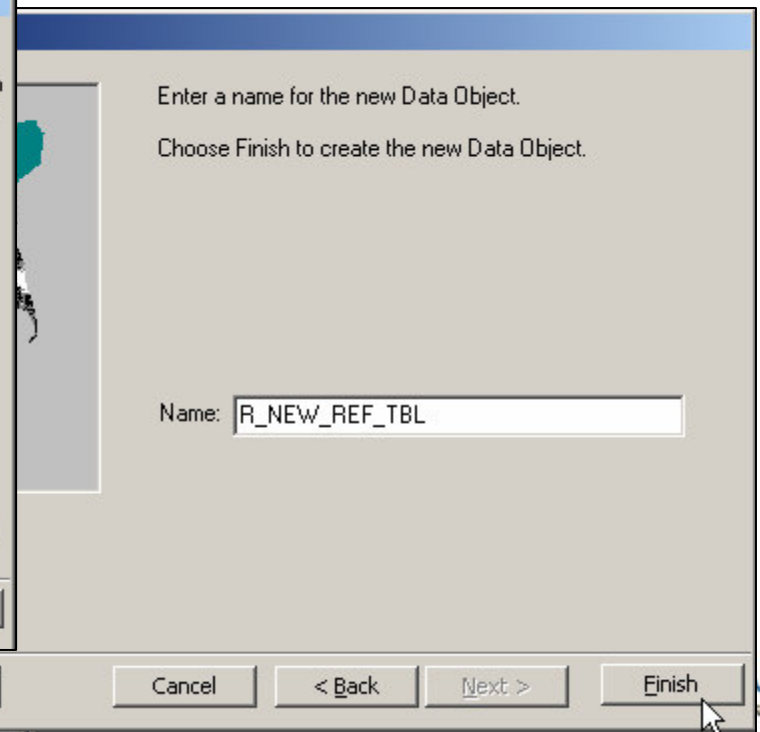
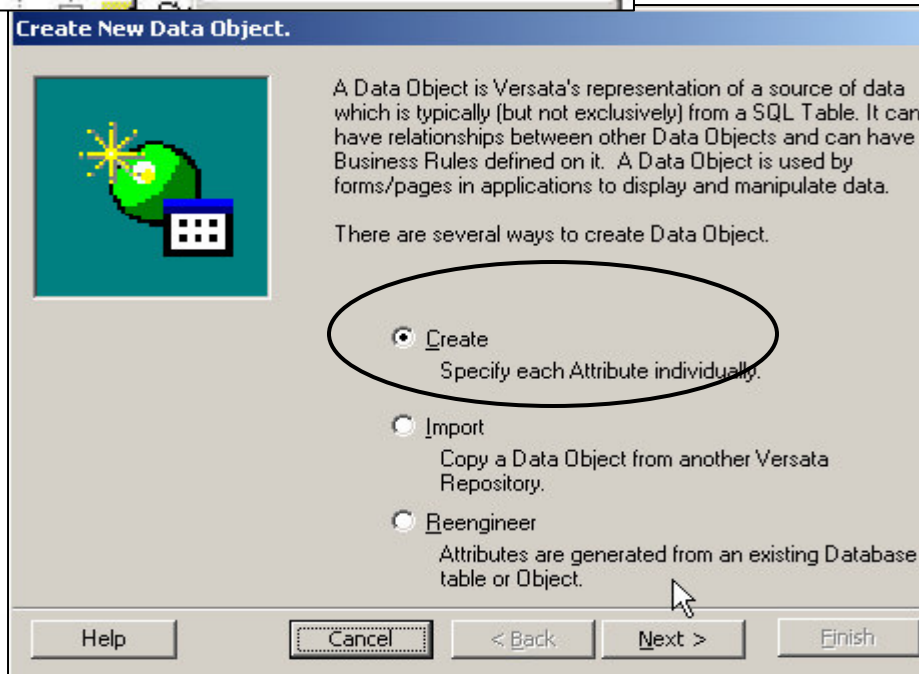
Data Object Actions

- Create
- Modify
- Rename
- Delete

Creating a new Data Object



Right click on 'Data Objects' to add. Follow instructions in Wizard.



Creating a new Data Object

- Right-click on Data Objects, then New Data Object
- Fill in the screens on the Data Object wizard. When you click on the Finish button, you're placed in the Business Rules Designer
- Use the Business Rules Designer to define the attributes.
- New data objects in the Explorer area in alphabetical order.

Modifying Existing Data Objects

- Double-click on object to invoke the Business Rules Designer, OR open the data object's XML file with a text editor and manipulate the code directly.

Renaming Existing Data Objects

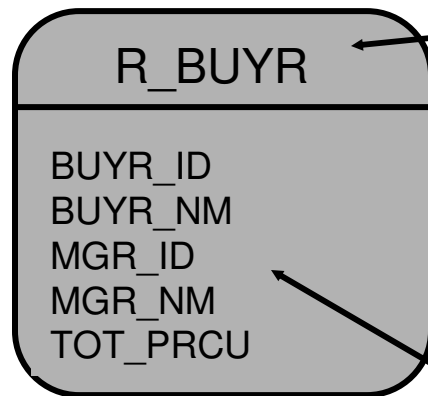
- Close the Business Rules Designer (even if it is on a different data object).
- Select the data object.
- Select the Edit menu, then Rename.
- In the resulting pop-up window, fill in the new name.

NOTE: Use caution when renaming objects. Doing so has major ramifications if this object is referenced by other objects.

Deleting Data Objects

- Close the Business Rules Designer (even if it is on a different data object).
- Select the data object.
- Select the Edit menu, then Delete Attribute.
- In the Delete Attribute pop-up window, select Yes.

Naming Conventions – Business Objects



Business Objects:

- Abbreviation indicates object's use
- Reference objects start with "R_"
- Query objects start with "Q_"

Attributes:

- Business word + class word

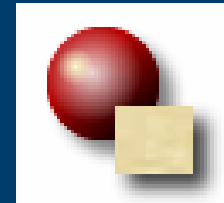
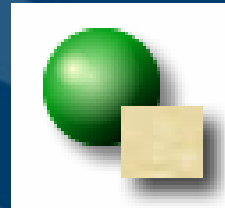
Naming Conventions Abbreviations

- AP – Accounts payable
- AR – Accounts receivable
- BS – Batch services
- CVL – coded values list
- GL – General ledger
- RA – Revenue accounting
- SC -- Security
- WF -- Workflow

Naming Conventions Attributes

- The names should consist of a business word and a class word. The business word should represent the business concept or the subject area of the data. The class word should identify the category or classification of the data.
- *Example business words:* ACCT (account), CUST (customer), EMPL (employee), TAXP (taxpayer).
- *Example class words:* DT (date), DY (day), FY (fiscal year), AMT (amount), CST (cost), PC (percentage), QTY (quantity), CD (code), CN (condition), FL (flag), ID (identifier), IND (indicator), NM (name), HDR (header), DB (database), LN (line)

Data Objects and Query Objects



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Modifying a Data Object



Double click on Data Object to open up Business Rules Designer (BRD)

The screenshot shows the 'Business Rules Designer - R_NEW_REF_TBL' window. The 'Attributes' tab is active, displaying a table with columns 'Name', 'Derivation', and 'Validation'. The table contains one row: 'Attribute1'. Below the table is a context menu with three options: 'Add Attribute...', 'Rename Attribute...', and 'Delete Attribute'. The 'Derivation' tab is selected at the bottom, showing a 'Derivation Type' dropdown set to 'None' and a checked 'Persistent' checkbox.

Name	Derivation	Validation
Attribute1		

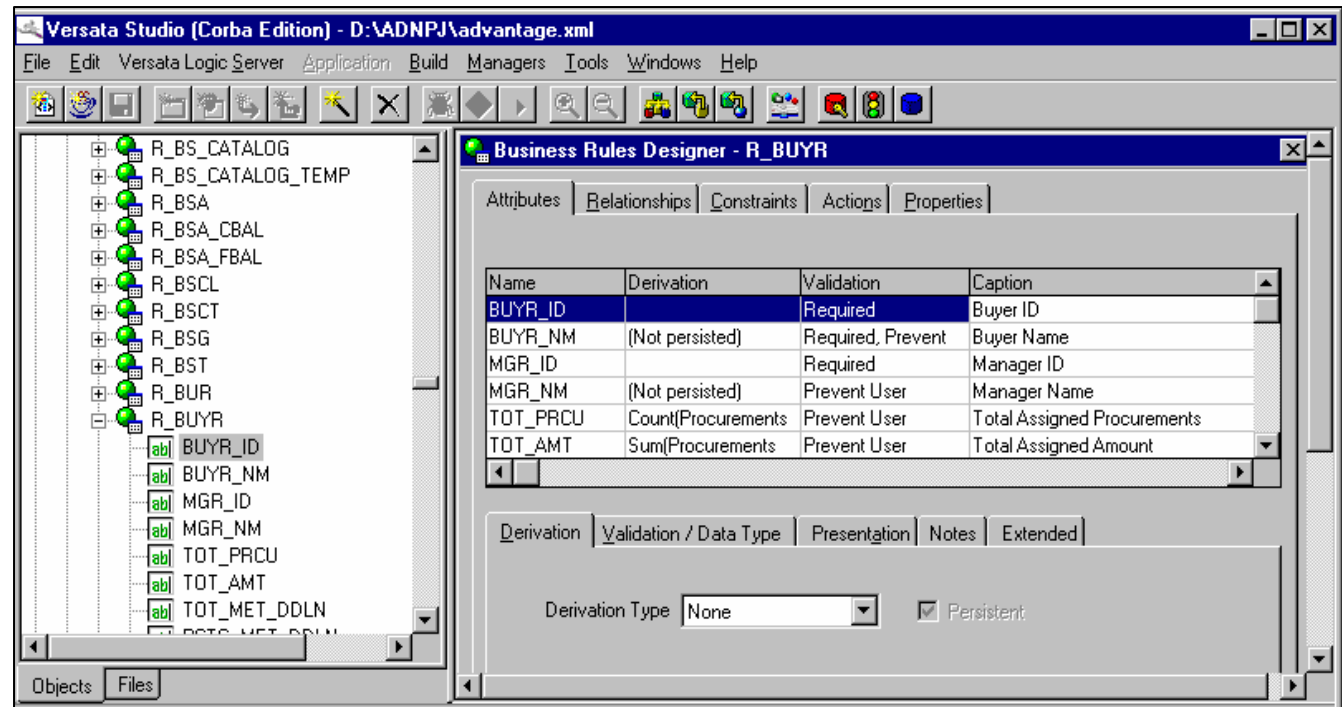
Right click in the Attribute area to add, rename or delete an attribute.

Characteristics of an attribute can be modified in the lower tabs

Working with Attributes

Add, Delete, Modify:

- Business Rules
 - Derivation
 - Validation and Data Type
 - Presentation



Rename and delete with caution. Versata does not update references to this attribute in constraints, actions, or custom code.

Attributes: Derivation

- **Sum**: Sums up values of specified attribute on child data object
- **Count**: Counts the number children that meet specified criteria
- **Parent Replicate**: Value pulled from a field on a parent data object
- **Formula**: Calculated field on save
- **Default**: Calculated field on insert
 - Cannot use methods except Time() and User()

Business Rules Designer - R_BUYR

Attributes | Relationships | Constraints | Actions | Properties

Name	Derivation	Validation
BUYR_ID		Required
BUYR_NM	(Not persisted)	Required, Prevent User Update
MGR_ID		Required
MGR_NM	(Not persisted) Replicate(Manager	Prevent User Update
TOT_PRCU	Count(Procurements [R_PRCU_ID])	Prevent User Update
TOT_AMT	Sum(Procurements	Prevent User Update

Derivation | Validation / Data Type | Presentation | Notes | Extended

Derivation Type: ☒ Persistent

None
Sum
Count
Parent Replicate
Formula
Default

Attributes: Validation and Data Type

The screenshot shows the 'Business Rules Designer - PO_DOC_HDR' window. The 'Attributes' tab is selected, displaying a table of attributes. The 'Validation' column for 'SUB_VEND_TOT_PC' is highlighted. Below the table, the 'Validation / Data Type' tab is active, showing the 'Validation Type' as 'Condition' and the 'Validation Condition' as '(Updating) AND (SUB_VEND_TOT_PC <= 100.00)'. The 'Validation Error' is '%c:A157.v:The total percentage for all Sub-Vendors'. At the bottom, the 'Data Type' is 'Number' with a 'Precision' of 7, and the 'Sub Type' is 'Decimal' with a 'Scale' of 4. The 'Prevent User Updates' checkbox is checked.

Name	Derivation	Validation
SUB_VEND_TOT_PC	Sum(PoDocSubvend	(Updating) AND (SUB_VEND
TOT_COMM_LN_CT	Sum(PoHdrVend	Required, Prevent User Updat
PCARD_ACCT_NO	Replicate(PcardAdm	Prevent User Update
PCARD_VAL_FL	If ((Inserting OR Updating)	Prevent User Update
VEND_CNT	Sum(PoHdrVend	Prevent User Update
PRCU_TYP_NM	Replicate(PoHdrPrculd	Prevent User Update

Derivation Validation / Data Type Presentation Notes Extended

Validation Type

☒ Condition

☐ Coded Values List

Validation Condition

(Updating) AND (SUB_VEND_TOT_PC <= 100.00)

Validation Error

%c:A157.v:The total percentage for all Sub-Vendors

Data Type Number Precision 7 Value Required

Sub Type Decimal Scale 4 Prevent User Updates

Field level
Validation

Rules Builder

Syntax Check

Attribute
characteristics

Attributes: Presentation

Name to be displayed on page.

Format can be selected from drop down list or typed in manually.

Defaults the attribute to display on any HTML page that defines the data object as its recordsource. This option should be set to false at this level.

Name	Derivation	Validation
DOC_ACTU_AM	Sum(PoHdrVend	Required, Prevent User Updat
FRGHT_AM	Default: 0	
SUB_VEND_TOT_PC	Sum(PoDocSubvend	(Updating) AND (SUB_VEND_
TOT_COMM_LN_CT	Sum(PoHdrVend	Required, Prevent User Updat
PCARD_ACCT_NO	Replicate(PcardAdm	Prevent User Update
PCARD_VAL_FL	If ((Inserting OR Updating)	Prevent User Update

Derivation | Validation / Data Type | **Presentation** | Notes | Extended

Caption
Document Amount

Format
\$#,##0.00;(\$#,##0.00)

Status Bar Message

Archetype Name
 ...

☒ Layout by Default

Attributes: Extended

The Extended tab allows specific attribute properties to be set including:

- AllowMixedCase
- IS_SIG_ATTR

Anytime AllowMixedCase is set for an attribute that is Searchable, an UpperCase attribute must be defined (note derivation).

Transaction Logic Designer - R_WHSE

Attributes | Relationships | Constraints | Actions | Properties

Name	Derivation	Validation
WHSE_CD		Required
WHSE_DSCR		Required
WHSE_DSCR_UP	AMSDDataObject.toUpperCaseString(WHSE_DSCR)	Prevent User Upd
WHSE_LOC_CD		Required
WHSE_LOC_TYP	Default: 3	Coded Values List
WHSE_LOC_NM	Replicate(LocTblToWhse [R_LOC_TBL].LOC_NM)	Prevent User Upd

Derivation | Validation / Data Type | Presentation | Notes | Extended

Property Name	Property Value
AllowMixedCase	Y

Add... Delete

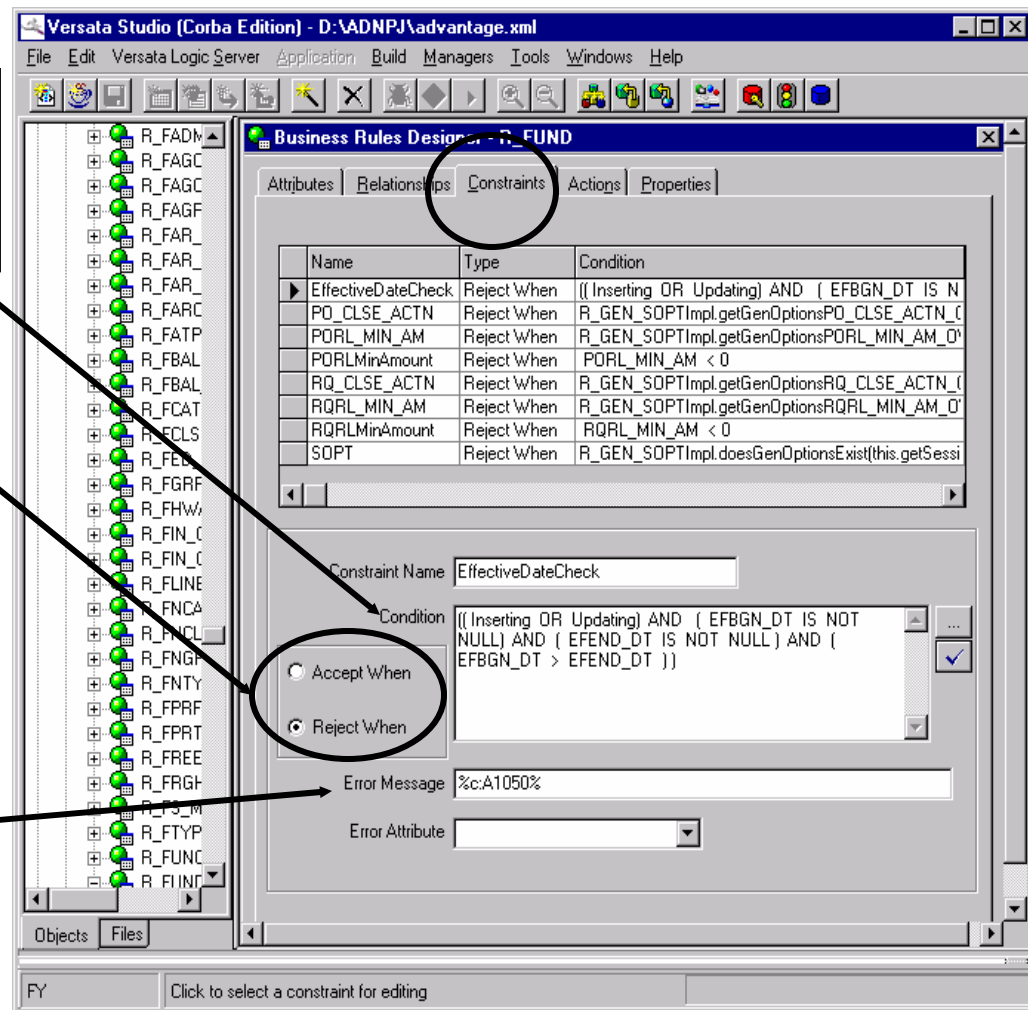
DataObject - Constraints

Validation involving 1 or more attributes on a DataObject

Accept when: Error is issued if condition is violated

Reject when: Error is issued if condition is met (more commonly used)

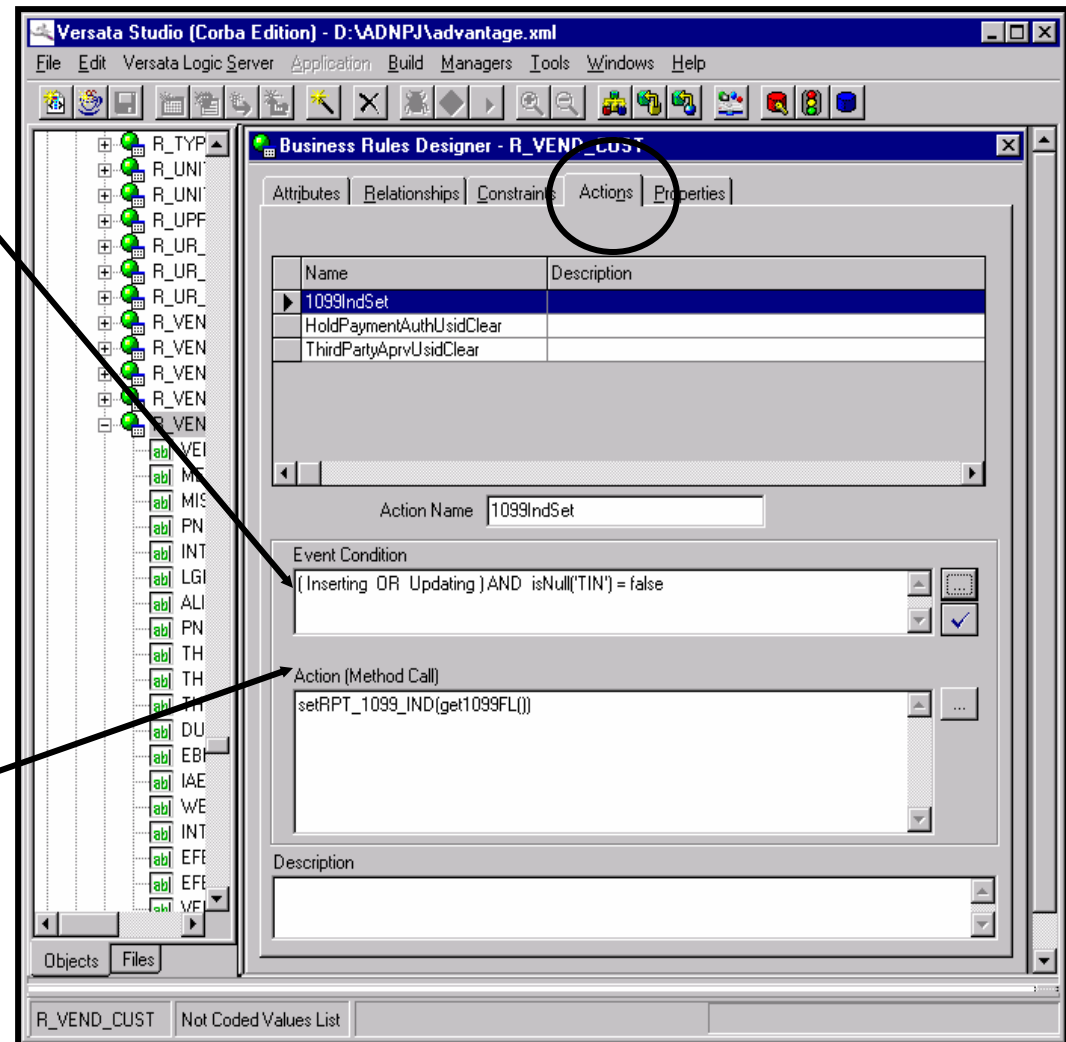
Where the error message or Error code value should be entered



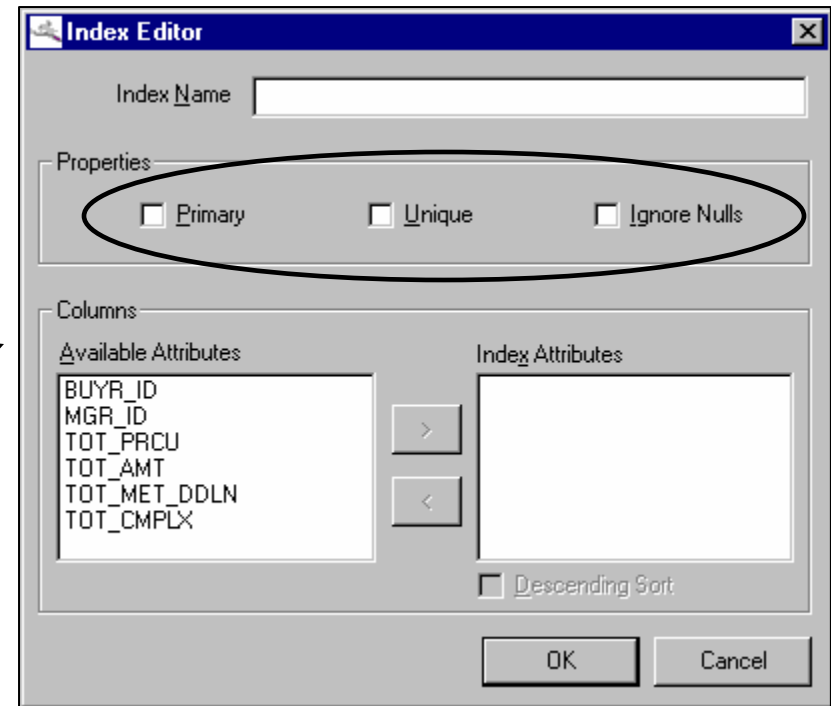
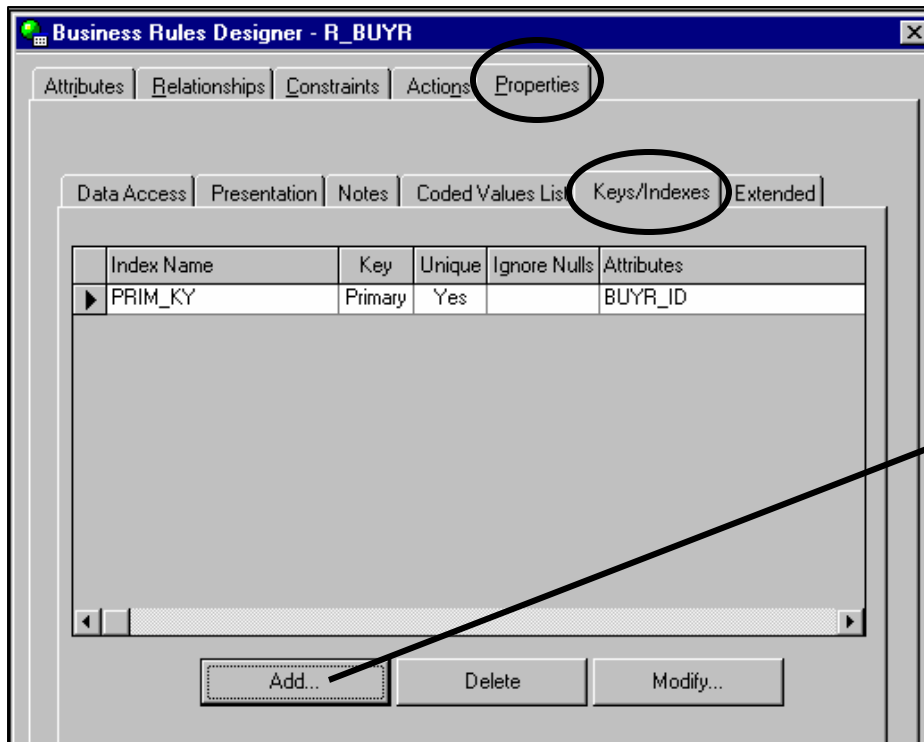
DataObject - Conditional Action

Conditions are added that will trigger the action logic to make the action method call.

Action executes the method specified. That method has to exist in your data object java file, otherwise the generated code will not compile. More commonly used to update other tables based on certain condition.



Primary Keys/Indexes



Indexes are used by the database for efficiently identifying, sorting, and searching the data objects.



If you want to change an attribute that is part of an index, you must remove the index first

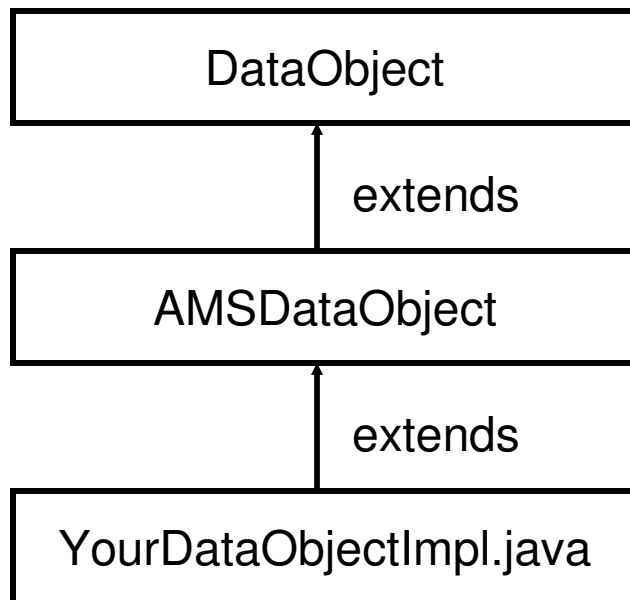
Primary Keys

To define a primary key:

- Open the data object that will be the parent in a relationship.
- Move to the Properties tab and then the Keys/Indexes tab.
- Click on the Add button. The Index Editor window appears.
- Enter the name of the index in the Index Name field. The naming convention for primary keys is “PRIM_KY.”
- Select the Primary checkbox.
- Using the arrow button, move the primary key attribute from the list in the left panel to the right panel.
- Repeat these steps for the data object that will be the child in the relationship.

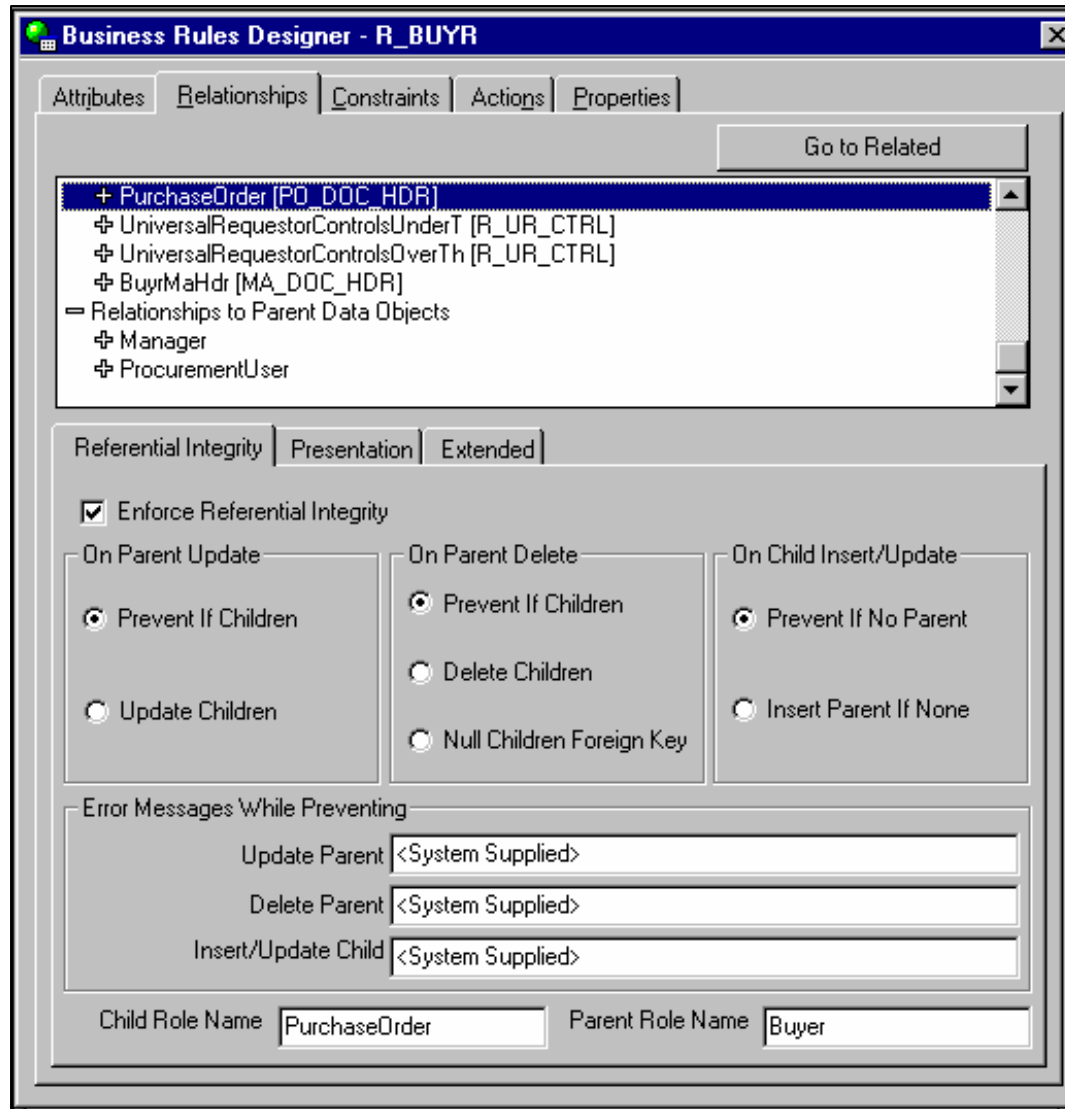
Class Hierarchy for Most Data Objects

AMSDDataObject extends Versata's DataObject. Your data objects must at least extend the AMSDataObject.



The screenshot shows the 'Business Rules Designer - R_BUYR' application. The 'Data Access' tab is selected. Under the 'XDA Connector' section, 'SQL' is selected. The 'Lock Mode' dropdown is set to 'All Applicable Attributes'. In the 'SuperClass' section, the 'Name' field is set to 'AMSDDataObject' and is circled in red. The 'Deployment' section has 'Deploy Attribute Security Data' unchecked.

Relationships



Business Rules Designer - R_BUYR

Attributes Relationships Constraints Actions Properties

Go to Related

- + PurchaseOrder [PO_DOC_HDR]
 - UniversalRequestorControlsUnderT [R_UR_CTRL]
 - UniversalRequestorControlsOverTh [R_UR_CTRL]
 - BuyrMaHdr [MA_DOC_HDR]
 - Relationships to Parent Data Objects
 - Manager
 - ProcurementUser

Referential Integrity Presentation Extended

☒ Enforce Referential Integrity

On Parent Update

- ☒ Prevent If Children
- ☐ Update Children

On Parent Delete

- ☒ Prevent If Children
- ☐ Delete Children
- ☐ Null Children Foreign Key

On Child Insert/Update

- ☒ Prevent If No Parent
- ☐ Insert Parent If None

Error Messages While Preventing

Update Parent <System Supplied>

Delete Parent <System Supplied>

Insert/Update Child <System Supplied>

Child Role Name PurchaseOrder Parent Role Name Buyer

Relationships Support:

- Derivations – ways of calculating a field automatically based on a relationship (sums, counts, parent replicates)
- Picks – feature on pages that allow a choice of valid codes for a field
- Referential Integrity – Code generated to enforce existence of data (I.e. 'Fund does not exist on the Fund table')



To change an attribute that is used to define a relationship, the relationship must first be removed.

Enforced/Unenforced Relationships

Business Rules Designer - R_BUYR

Attributes Relationships Constraints Actions Properties

Go to Related

+ PurchaseOrder [PO_DOC_HDR]

- UniversalRequestorControlsUnderT [R_UR_CTRL]
- UniversalRequestorControlsOverTh [R_UR_CTRL]
- BuyrMaHdr [MA_DOC_HDR]
- Relationships to Parent Data Objects
 - Manager
 - ProcurementUser

Referential Integrity Presentation Extended

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- ☐ Delete Children
- ☐ Null Children Foreign Key

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- ☒ Prevent If No Parent
- ☐ Insert Parent If None

Error Messages While Preventing

Update Parent <System Supplied>

Delete Parent <System Supplied>

Insert/Update Child <System Supplied>

Child Role Name PurchaseOrder Parent Role Name Buyer

Referential integrity rules preserve relationships between data objects. Relationships must be enforced if the relationship is to be used in rules. Separate referential integrity rules can be enforced for parent updates, parent deletes, and child insert/updates.

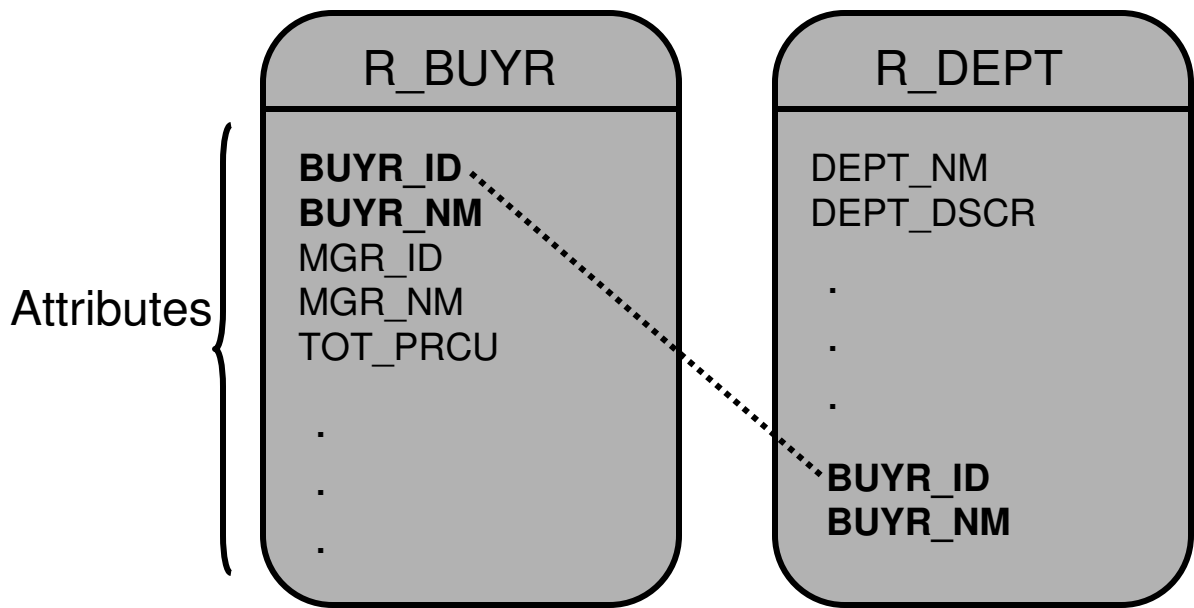


To change an attribute that is used to define a relationship, the relationship must first be removed.

Adding a Relationship

- Select either the parent or the child object.
- Right click and select Add Relationship.
- Indicate whether this object is the parent or the child.
- Select the Add button.
- Select the key attributes to be mapped between these objects. NOTE: The types must match.
- Repeat the above steps for the other object in the relationship.

Relationships between Data Objects



Relationship:
R_BUYR is the parent;
R_DEPT is a child

If relationship is enforced, the R_BUYR record has to follow the referential integrity options chosen under “On Parent Update” and “On Parent Delete”, R_DEPT has to follow the “On Child Insert/Update” option choice.

Derivation | Validation / Data Type | Presentation | Notes | Extended

Derivation Type: Parent Replicate ☒ Persistent

Derivation Rule

Data Object	Attribute
WhseToInvn [R_WHSE]	WHSE_DSCR

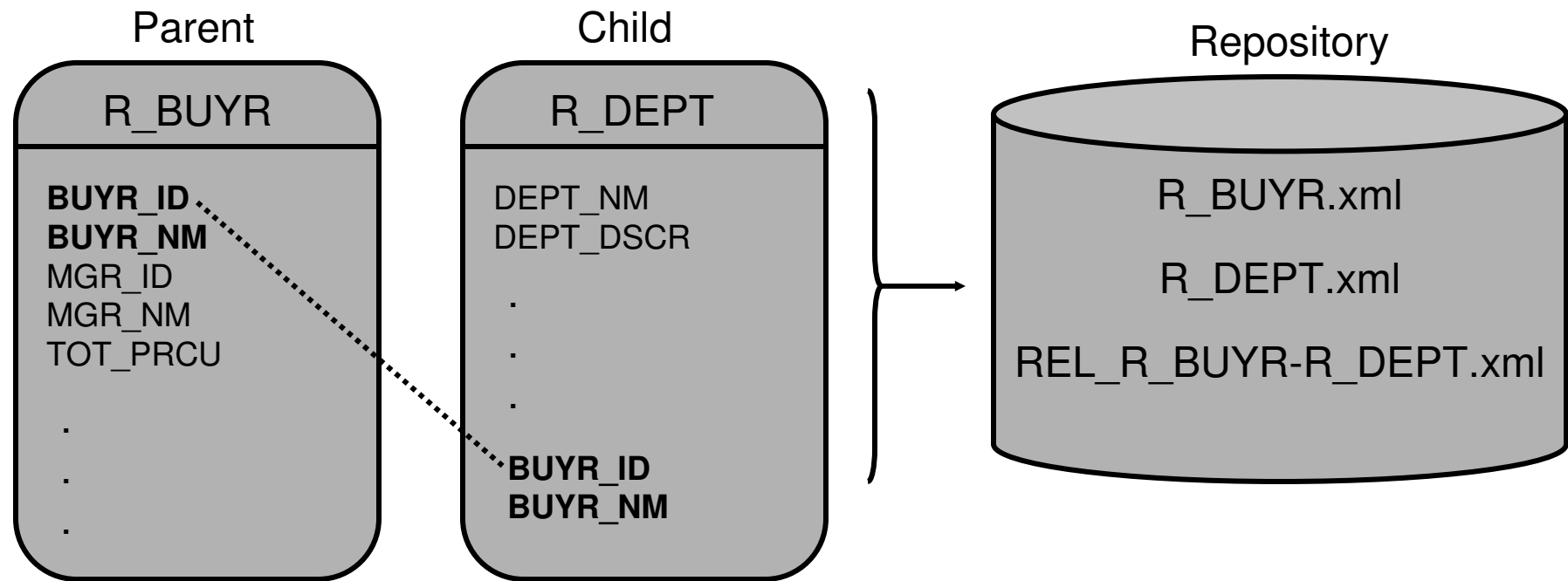
☒ Maintained

Parent Replicates can be used from relationships.

Persistent – data is physically stored on the table.

Maintained – data is updated on child table when parent is updated.

Repository Files Created for Relationships



Versata creates an XML file for each relationship and modifies the information in the XML files for the parent and the child object. The relationship file is placed in the same dataobject subfolder as the parent.

Example of XML created for Relationships

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE Relationships SYSTEM "Relation.dtd">
<Relationships
  DTDVersion="05.05.12">
  <Relationship
    IsEnforce="True"
    OnParentUpdate="PreventIfChildren"
    OnParentDelete="PreventIfChildren"
    OnChildInsertOrUpdate="PreventIfNoParent"
    CountAggregates="0"
    CountReplicates="0"
    ChildRoleName="R_BURs1"
    ParentRoleName="R_DEPT34"
  >
    <AscendCaption><![CDATA[R_DEPT]]> </AscendCaption>
    <DescendCaption><![CDATA[R_BUR(s)]]> </DescendCaption>
    <ErrPreventInsertOrUpdateChild><![CDATA[%c:A761,v:Department,v:Department Table%]]> </ErrPreventInsertOrUpdateChild>
    <ErrPreventDeleteParent><![CDATA[%c:A760,v:Bureau record%]]> </ErrPreventDeleteParent>
    <ErrPreventUpdateParent><![CDATA[%c:A759,v:Department,v:Bureau record%]]> </ErrPreventUpdateParent>
    <AttributePairs>
      <AttributePair
        ParentAttribute="DEPT_CD"
        ChildAttribute="DEPT_CD"
      />
    </AttributePairs>
  </Relationship>
</Relationships>
```

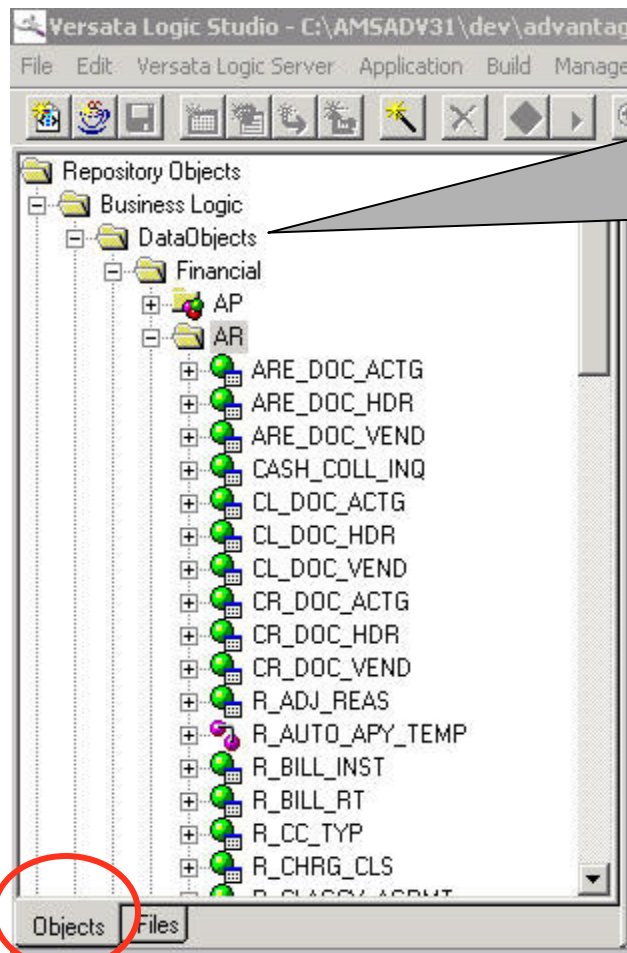


Development Directory Structure

AMS ADVANTAGE® 3
Application Development



Objects versus Files



Objects:

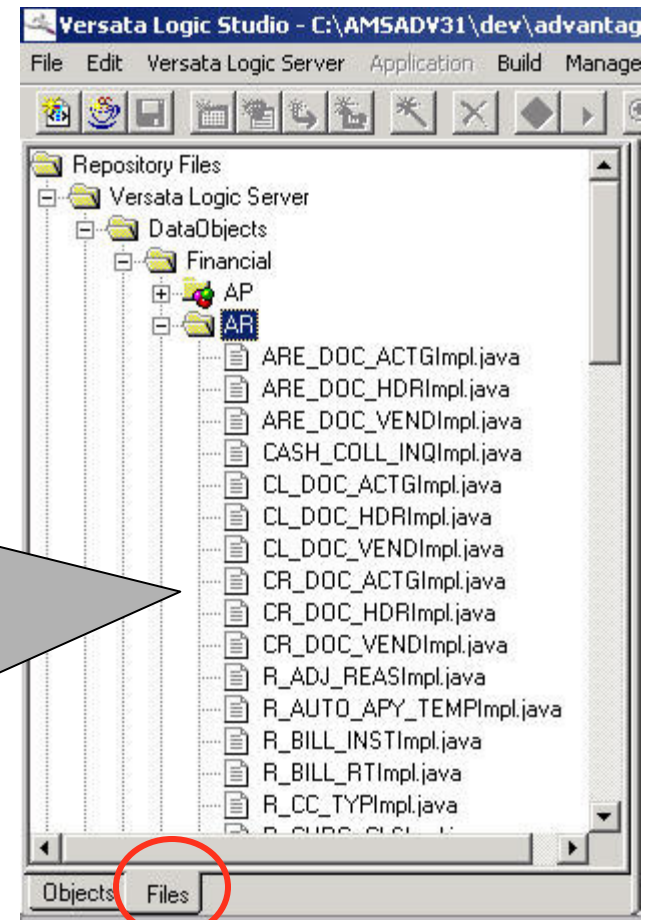
View/Edit with the Business Rules Designer.

** Double-clicking on an object will bring up the Business Rules Designer*

Files:

Java files created by Versata for each data object during a build. View/Edit with the Code Editor or an External text editor.

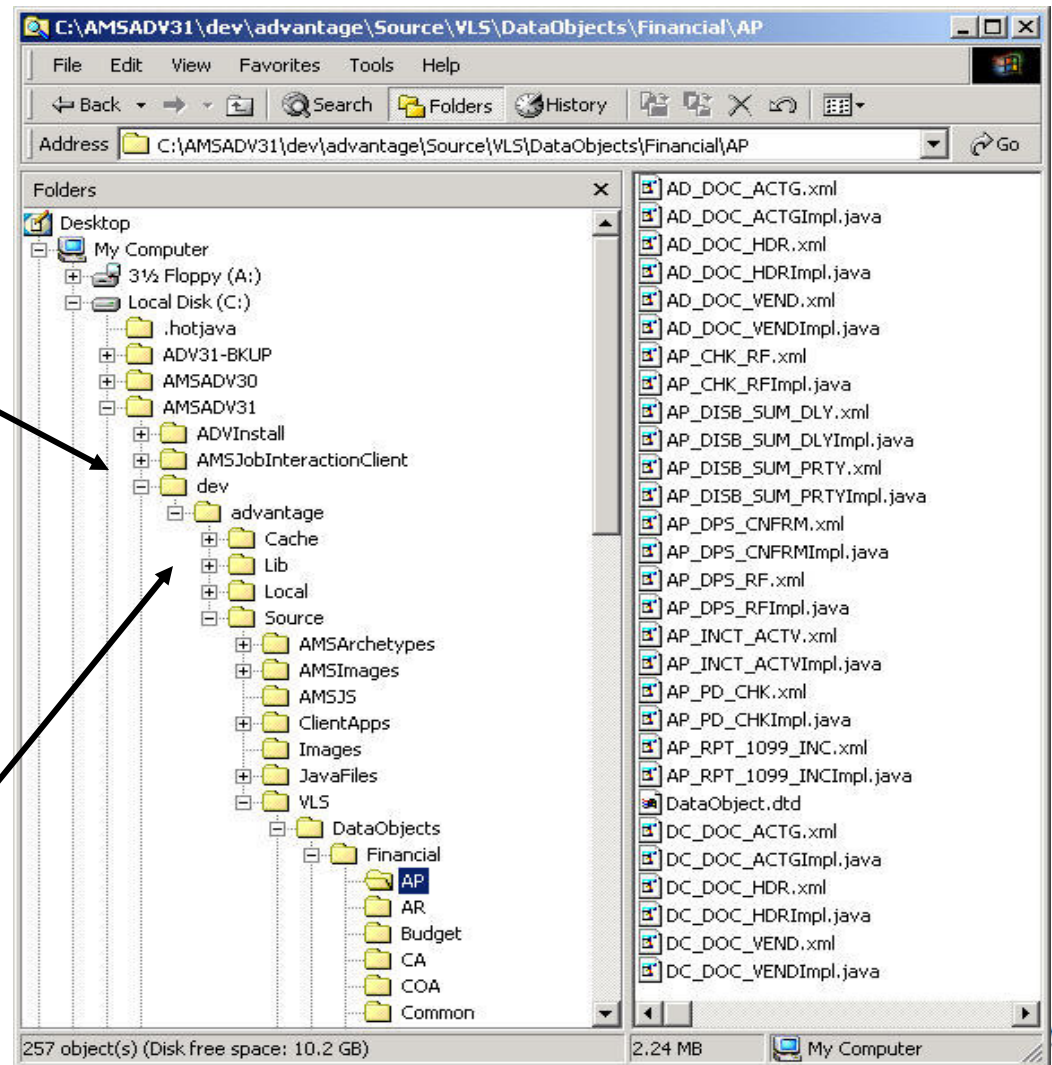
** Double-clicking on a file will bring up the Versata code editor*



Where are These Repository Files on My Computer?

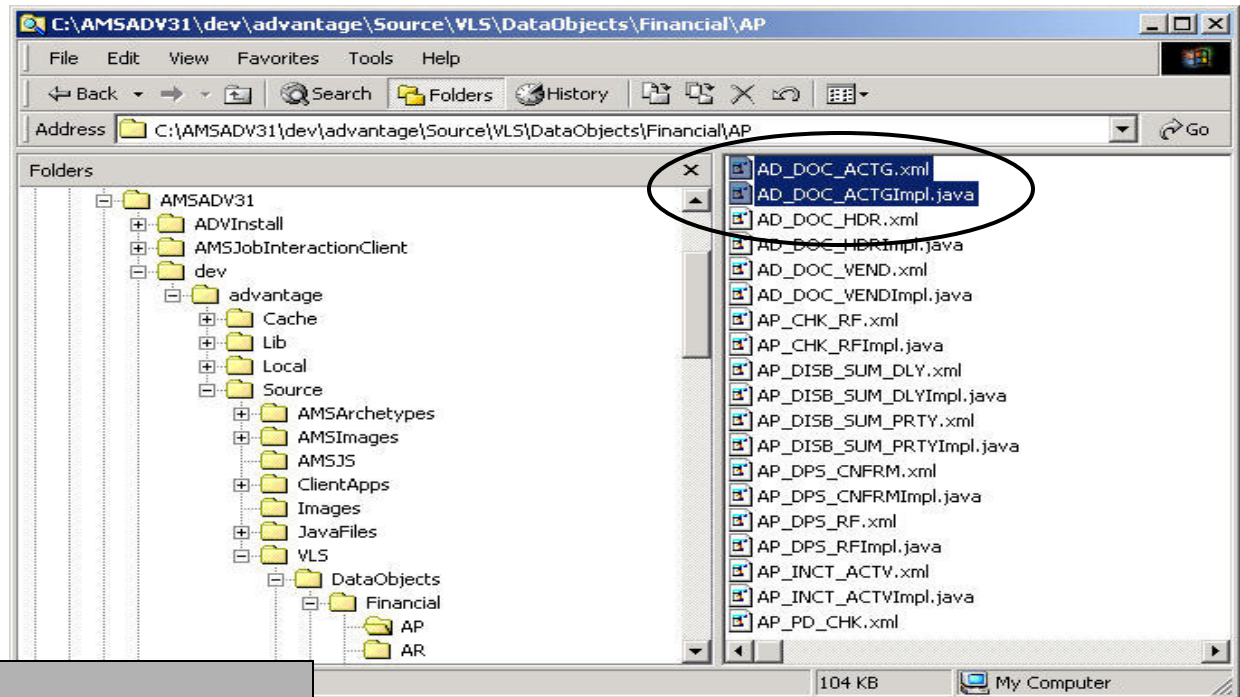
The repository files are all within the AMSADV3\dev\advantage directory on the drive where Versata is installed.

Data Objects are stored in the VLS\DataObjects directory under:
AMSADV3\dev\advantage\Source\
VLS\DataObjects



Repository Consists of Different Types of Files

Under the Data Object directory, there will be an *xml* and *java* file for each business object.



Sometimes required setup data are stored for a data object in the repository. If so, there will be a *csv* (comma separated values) file for that data object as well.

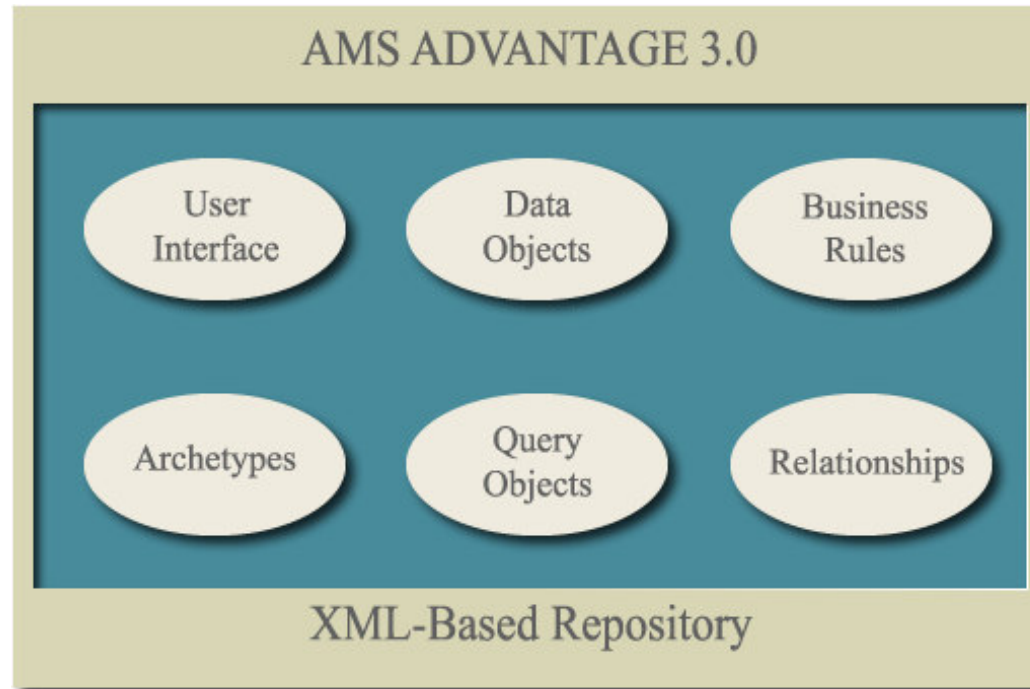
File Locations

- Do not have to memorize where the files are located
- Use Windows Explorer Search to find your files...search from 'dev' directory

The screenshot shows the Windows Search interface. On the left, the 'Search' pane is open with 'Search for Files and Folders' selected. The search criteria are 'fPASS*' and the location is 'C:\AMSADV3_HR33\dev'. The 'Search Now' button is visible. On the right, the 'Search Results' pane shows a list of files found. The files are listed in a table with columns 'Name' and 'In Folder'.

Name	In Folder
fPASS.Built	C:\AMSADV3_HR33\dev\advantage\Cache\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app
fPASSBase.java	C:\AMSADV3_HR33\dev\advantage\Cache\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app
fPASS.class	C:\AMSADV3_HR33\dev\advantage\Lib\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app\advantage\HR_EmployeeProfi
fPASSBase.class	C:\AMSADV3_HR33\dev\advantage\Lib\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app\advantage\HR_EmployeeProfi
fPASS.htm	C:\AMSADV3_HR33\dev\advantage\Local\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app\HTMLBackup
fPASS.htm	C:\AMSADV3_HR33\dev\advantage\Source\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app
fPASS.java	C:\AMSADV3_HR33\dev\advantage\Source\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app
fPASS.xml	C:\AMSADV3_HR33\dev\advantage\Source\ClientApps\HTMLApps\HR_EmployeeProfileManagement.app

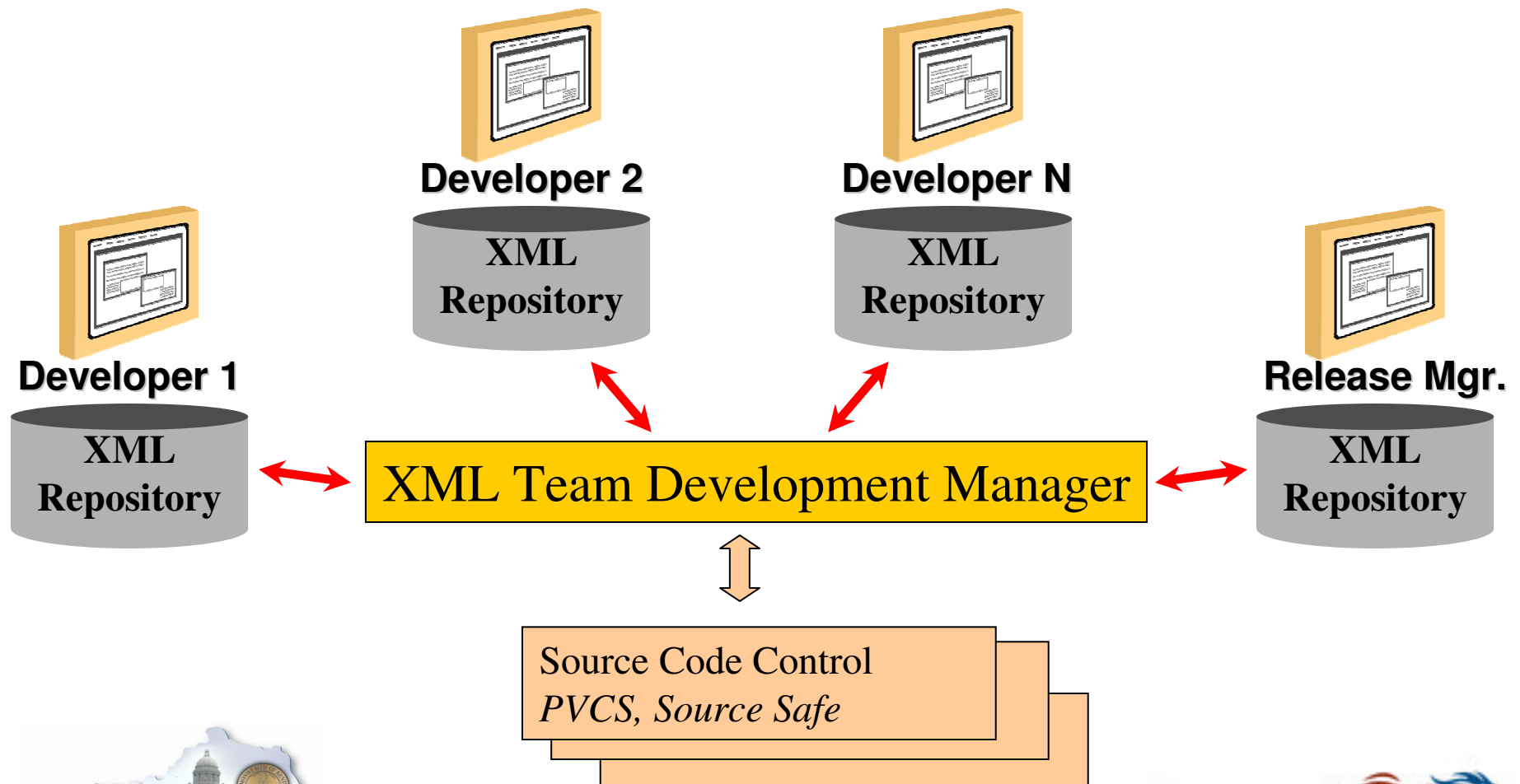
ADVANTAGE Supports a Central Repository that Contains All Application Information



Repository is updated through the ADVANTAGE Studio

Central Repository - \\AMSADV3\dev\advantage\Source\Advantage.xml

Development Environment



Central Repository

- Advantage.xml contains the information on all data objects, relationships, query objects, and applications.
- Used to load objects into Versata studio.
- Can be modified manually or through the studio.

Advantage.xml

- Contains the following items
 - Listing of all the data objects in the repository
 - Listing of all the relationships in the repository
 - Listing of all the query objects in the repository
 - Reference to the location of the custom html archetype folder
 - Listing of other files (java files) within the repository
 - Listing of the HTML application in the repository

Advantage.xml

```
<DataObjects>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG</DataObject>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG_CTL</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BF_ITEM_ST</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_JOB_PRTY</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_NODE_TYPE</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_RUNPOLICY</DataObject>

<QueryObjects>
  <QueryObject>QueryObjects\Infrastructure\DocEngine\OBJ_ATT_ALT_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\FormsPrinting\PRNT_JOB_SRV_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_FLDR_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_TBL_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\VIEW_ALL_JOBS_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\Navigation\q_InPages</QueryObject>

<Relationships>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-IN_DOC_CREA_ACTN</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_SC_USER_DOC_COMP</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV_COMP</Relationship>

<HTMLApplications>
  <Application>Advantage</Application>
  <Application>GenMRT</Application>
  <Application>PasswordReset</Application>
  <Application>Prototype</Application>
```


Break

AMS ADVANTAGE[®] 3
Application Development



Building and Compiling Data Objects

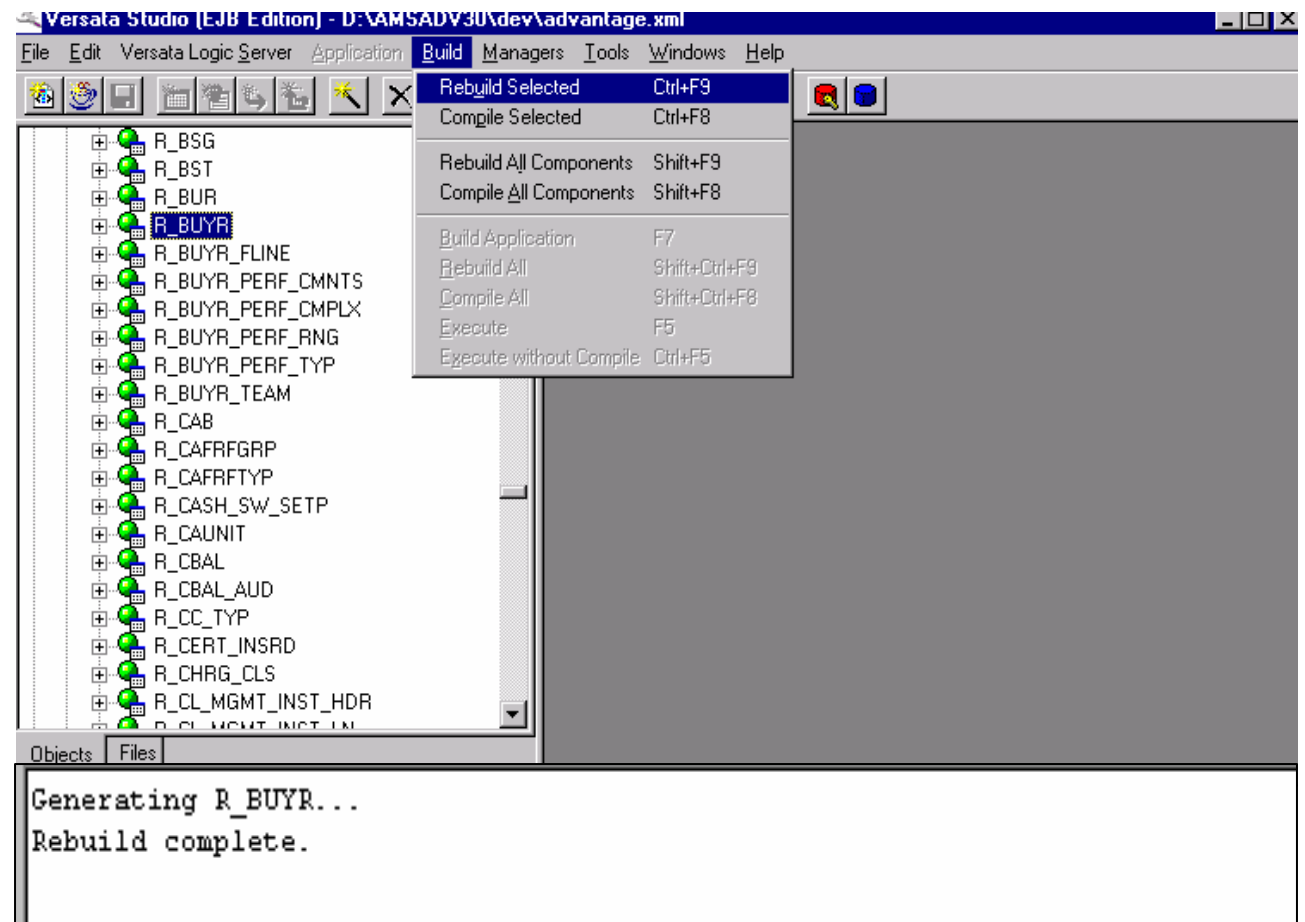
AMS ADVANTAGE® 3
Application Development



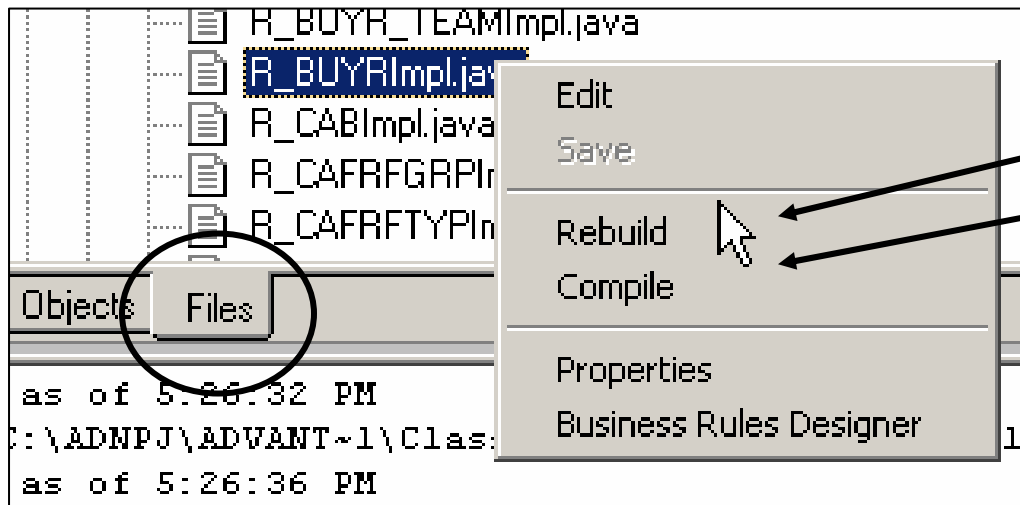
Rebuilding the Data/Query Object

First select the object and then choose 'Rebuild Selected' option from Build menu.

Message area tells you when the action is complete

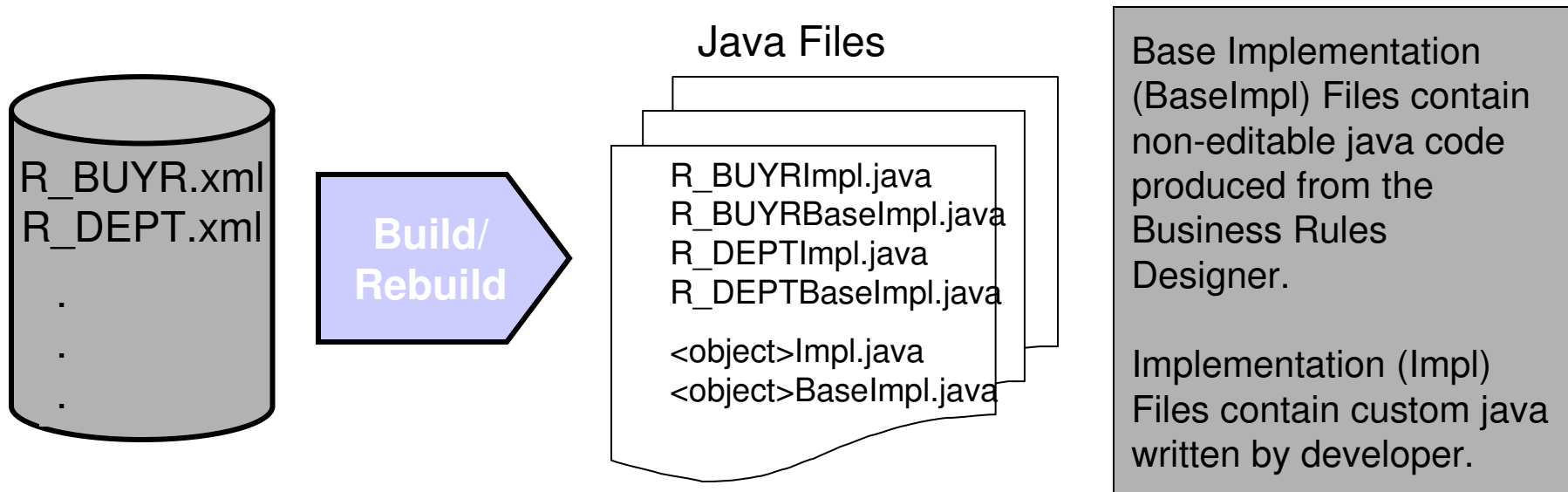


Alternate Rebuild/Compile Menu



On the Files tab in the Studio, right-clicking on the file provides another way to get to the Rebuild and Compile options.

Building Java Files from Data/Query Objects



Where are these files stored on my computer?

BaseImpl

\\AMSADV3\dev\advantage\Cache\VLS\DataObjects\Financial\<application>

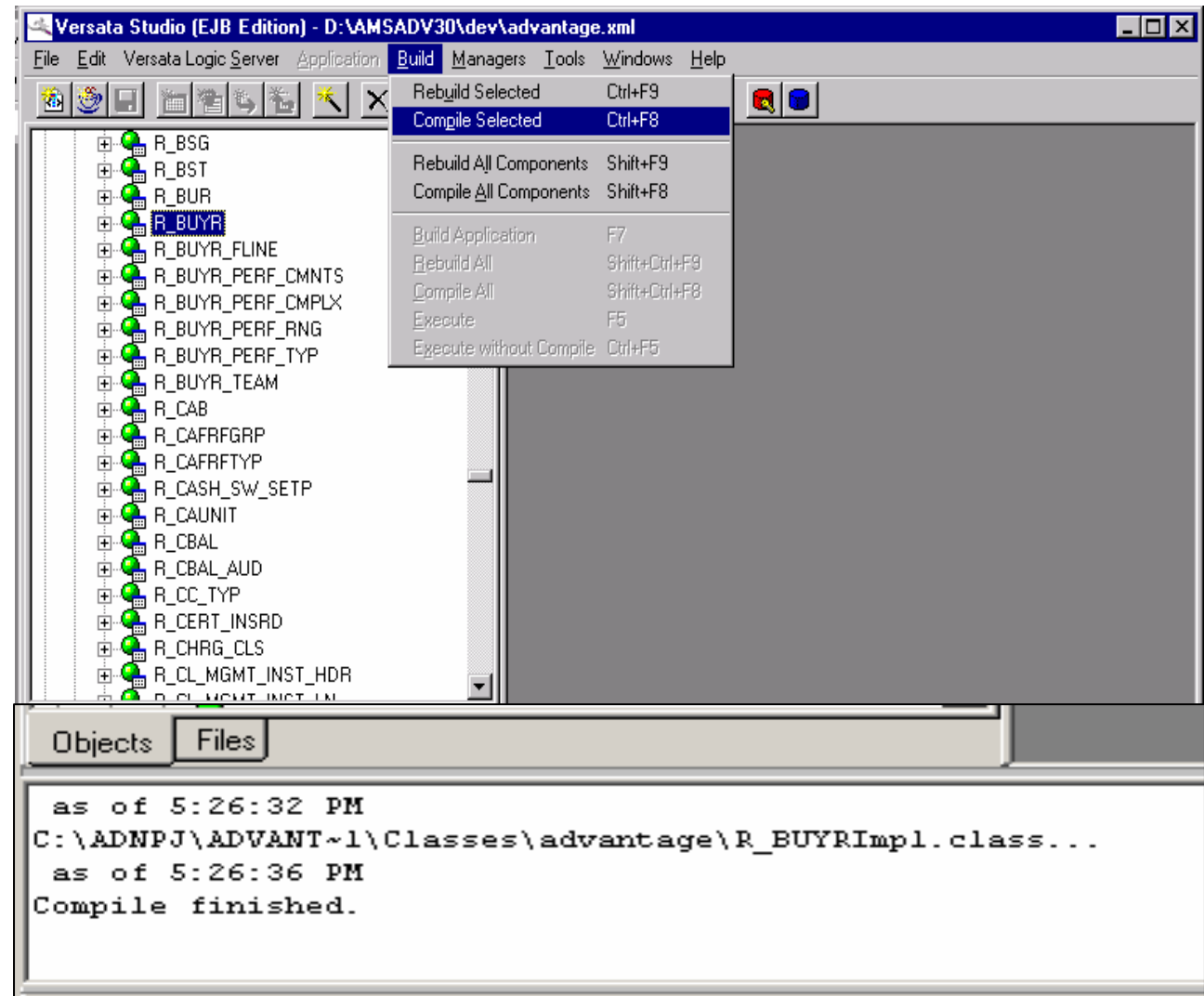
Impl

\\AMSADV3\dev\advantage\Source\VLS\DataObjects\Financial\<Application>

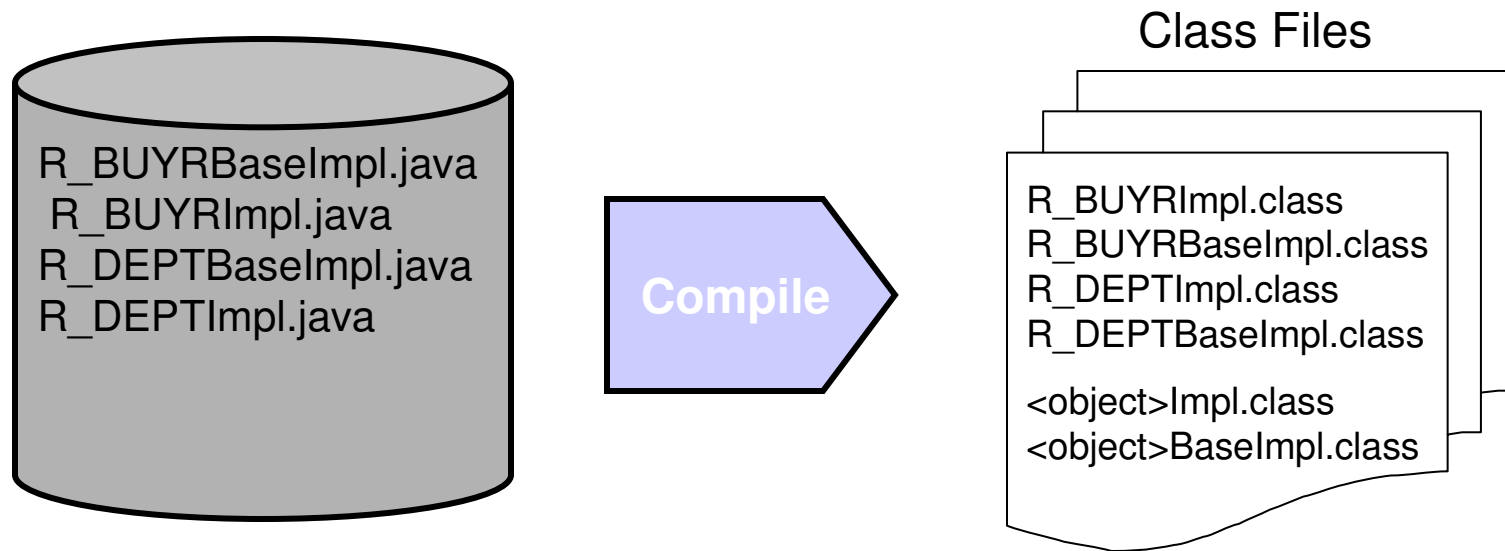
Compiling the Data/Query Object

First select the object and then choose 'Compile Selected' option from Build menu.

Message area tells you when the action is complete. If you have compile errors, they will show up here.



Compiling the Data/Query Object



Class files are stored in:

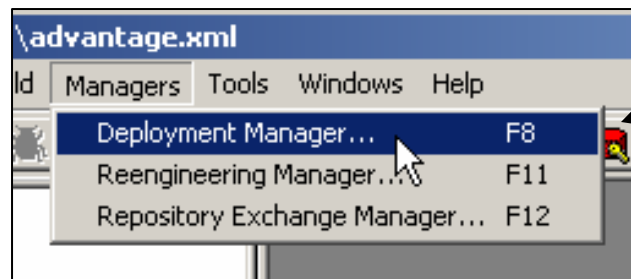
\\AMSADV3\dev\advantage\Lib\VLS\advantage

Data Object and Database Deployment

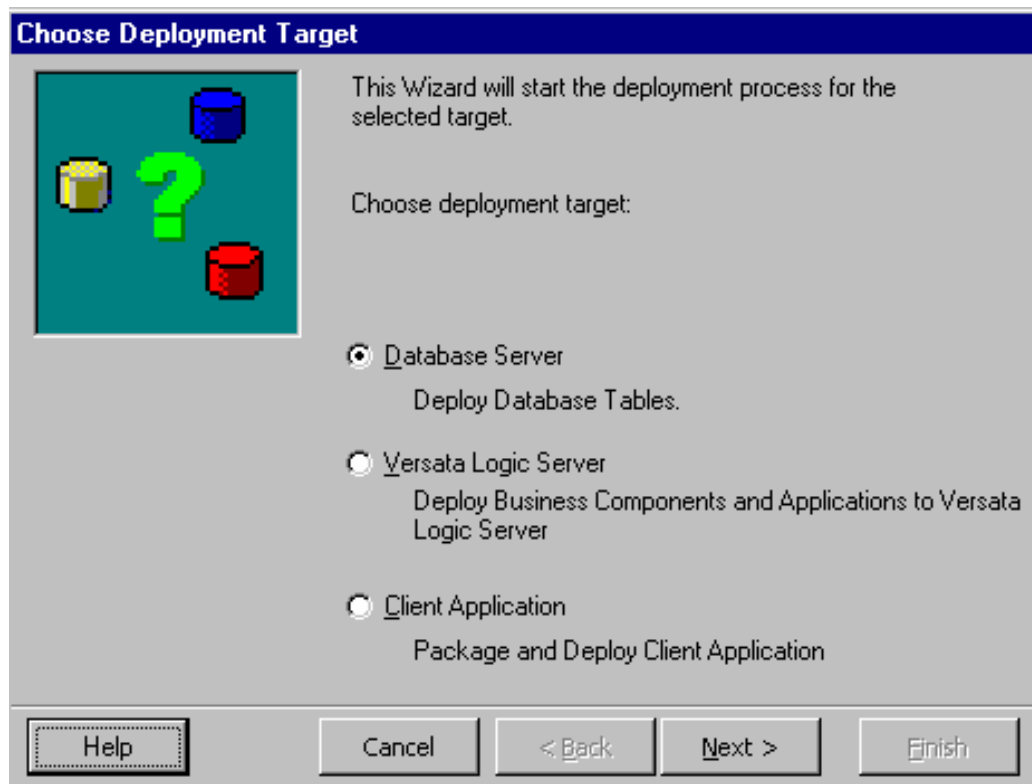
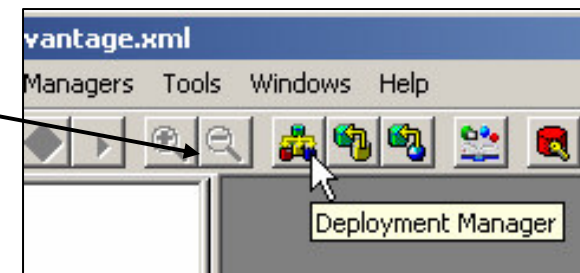
AMS ADVANTAGE® 3
Application Development



Deployment Manager



Open the
Deployment
Manager – one
of two ways



Deployment manager
has options for
Database, VLS and
Application
deployment.

Deployment - VLS

What is a VLS deploy doing?

- Copying class files **from**
C:\AMSADV3\dev\advantage\Lib\VLS\advantage **to**
C:\AMSAPPS\Versata\VlsComponents\Classes\advantage.ear\advantage.jar\advantage
- Registers New DO & QO in VLS Console
 - Newly registered objects require 2 actions:
 - 1. Assign object to main Data Server
 - 2. Grant permissions to object

Changes in 3.4

- The deploy directory structure has changed in 3.4
 - From
C:\AMSAPPS\Versata55_50\VisComponents\Classes\advantage.ear
 - To
C:\AMSAPPS\Versata56_51\config\mydomain\installedApps\<cellname>\advantage.ear

Versata Logic Server (VLS) Deployment

Choose Deployment Target

This Wizard will start the deployment process for the selected target.

Choose deployment

- ☐ Database Server
- ☐ Versata Logic Server
- ☒ Deploy Iran
- ☐ Deploy Proc
- ☐ Client Application

Package and Deploy Client Application

Buttons: Help, Cancel, < Back, Next >

Deployment Options

Rebuild

- ☐ Force
- ☐ Incremental
- ☒ None

Compile

- ☐ Force
- ☐ Incremental
- ☒ None

Buttons: OK

Choose Versata Logic Server for Deployment

Choose location of the Versata Logic Server install folder.

Versata Logic Server install folder:

C:\AMSAPPS\VersataD

☐ Incremental Build of Deployable Jar

Buttons: Help, Cancel, < Back, Next >

Finished

The wizard is now ready to deploy to the Versata Logic Server. After deployment, you may use the Versata Logic Server Console to manage security on the deployed objects.

Choose Finish to deploy to the server indicated below.

Host: npowers-24557

Server: npowers-24557

IMPORTANT: 'Restart WebSphere Applications' will not start the WebSphere Application Server. Start the application server from the Studio Toolbar button.

- ☒ Restart WebSphere Applications
- ☒ Register Beans to WebSphere

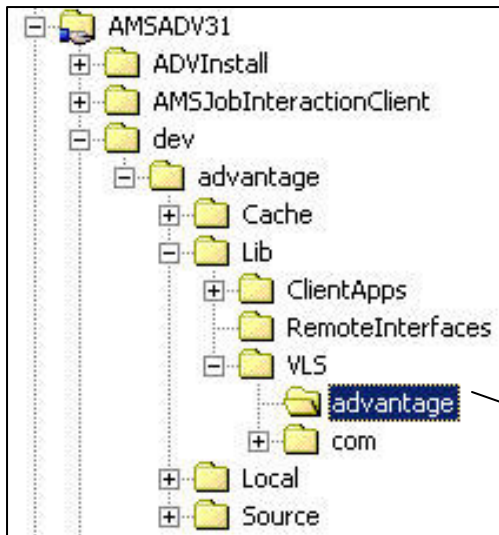
WebSphere AppServer Name: VERSATA

Buttons: Help, Cancel, < Back, Next >, Finish

Annotations:

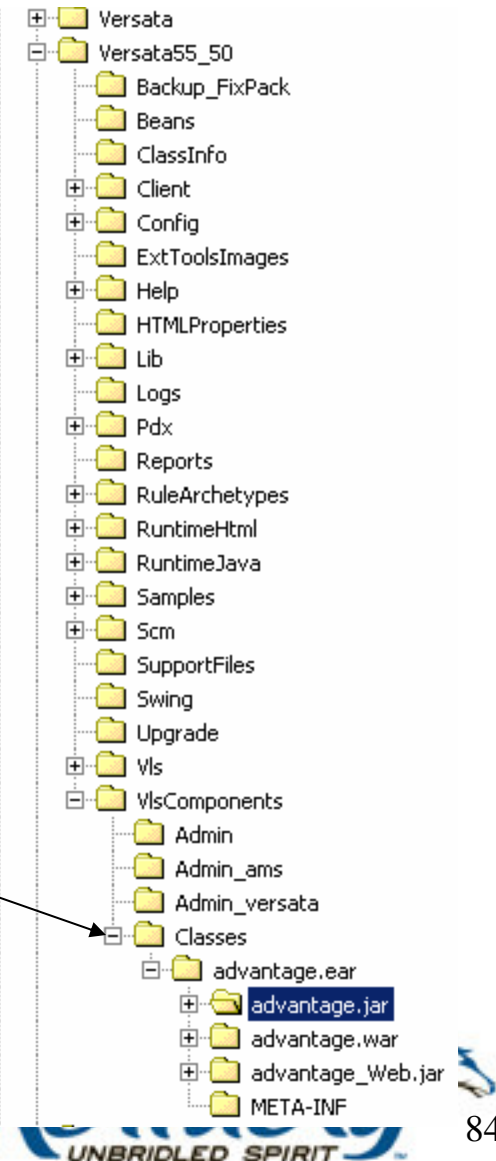
- Callout 1: Select "None" for Rebuild and Compile (Developer should compile before deploying)
- Callout 2: Versata Path
- Callout 3: Restart WebSphere and Register Beans
- Callout 4: This process will move class files into the application. The server must be restarted before changes can be seen.

Versata Logic Server (VLS) Deployment

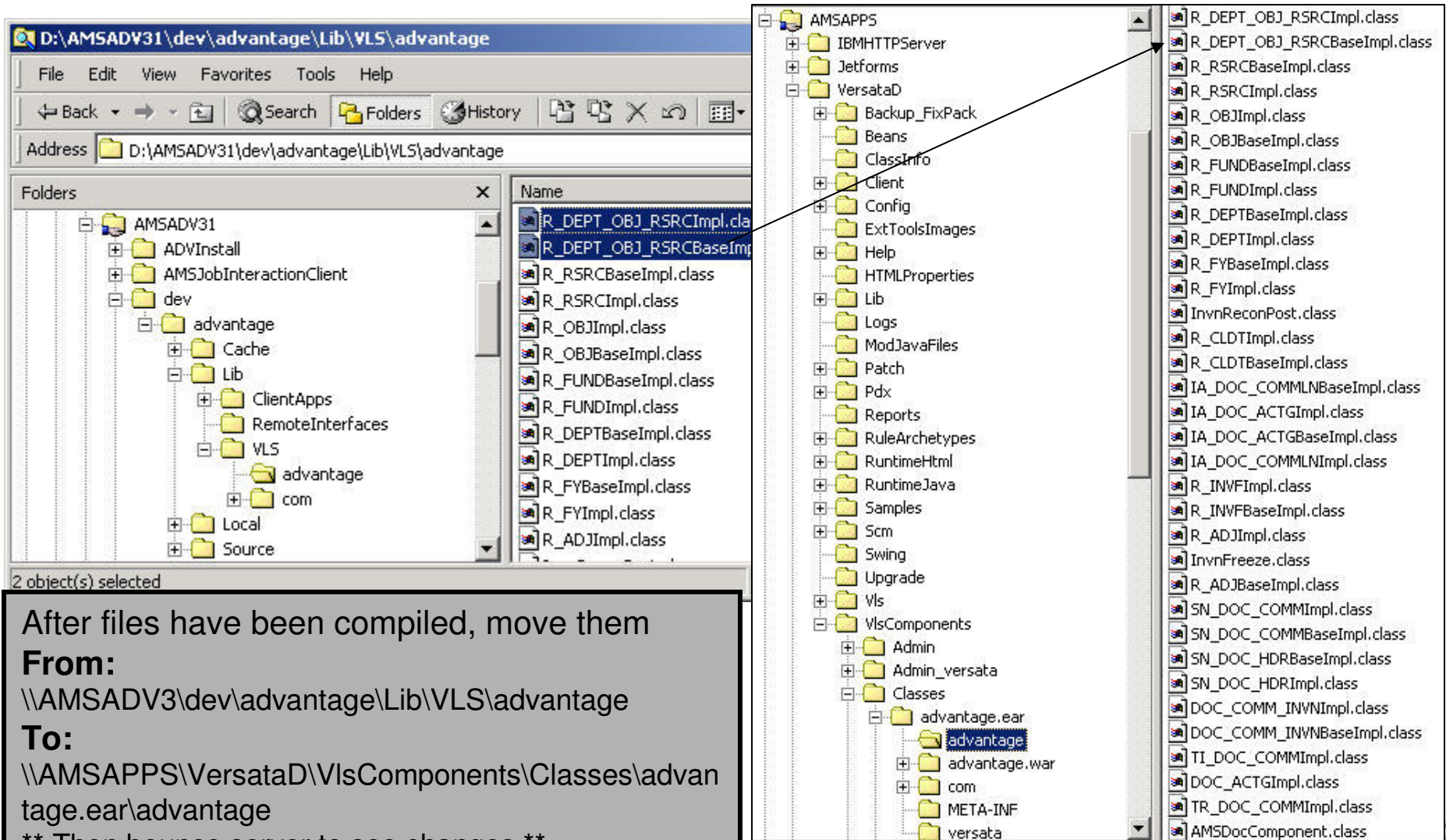


The Versata Logic Server Deployment process copies compiled class files to application directory accessed by the VLS.

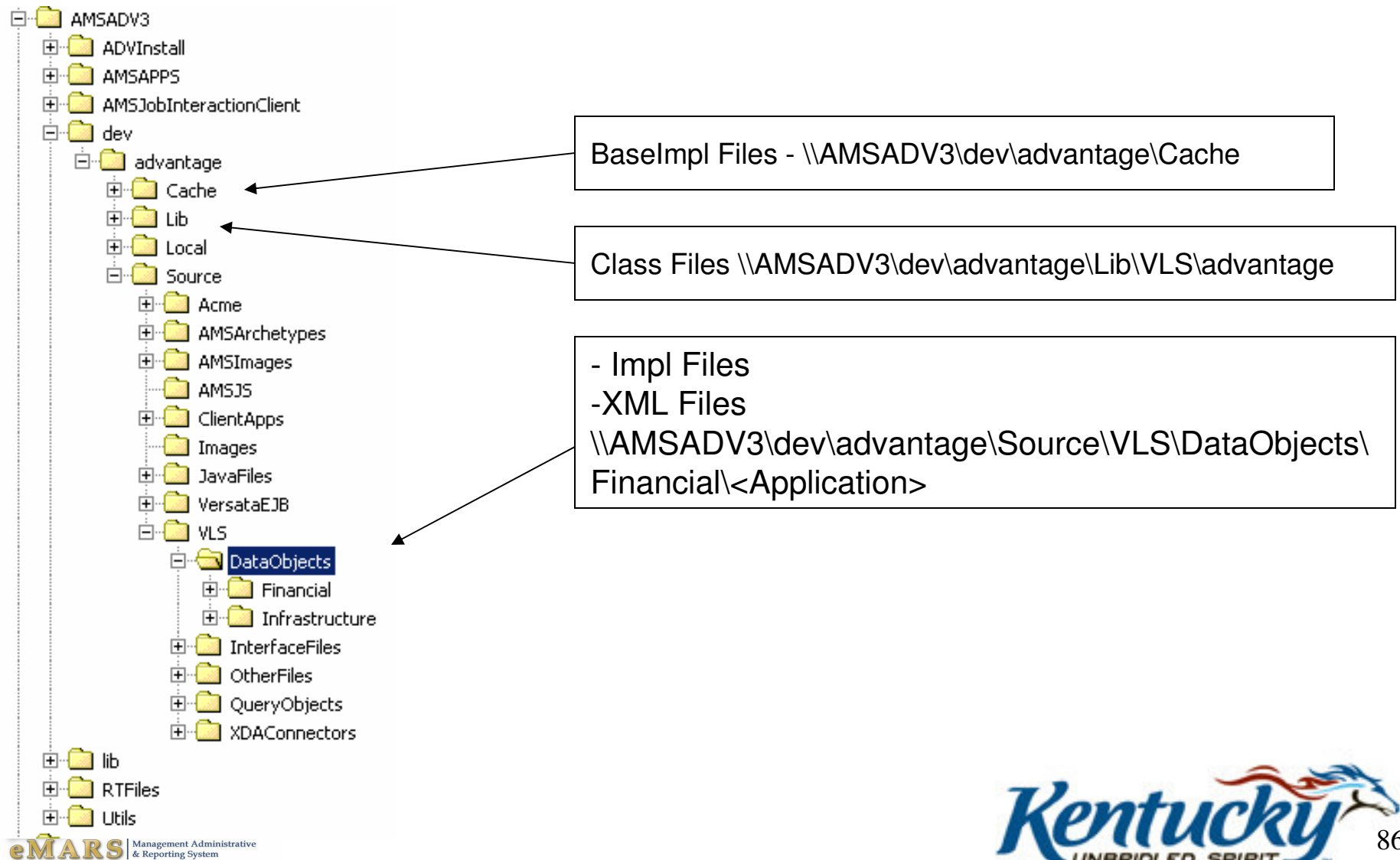
From – AMSADV3
To - AMSAPPS



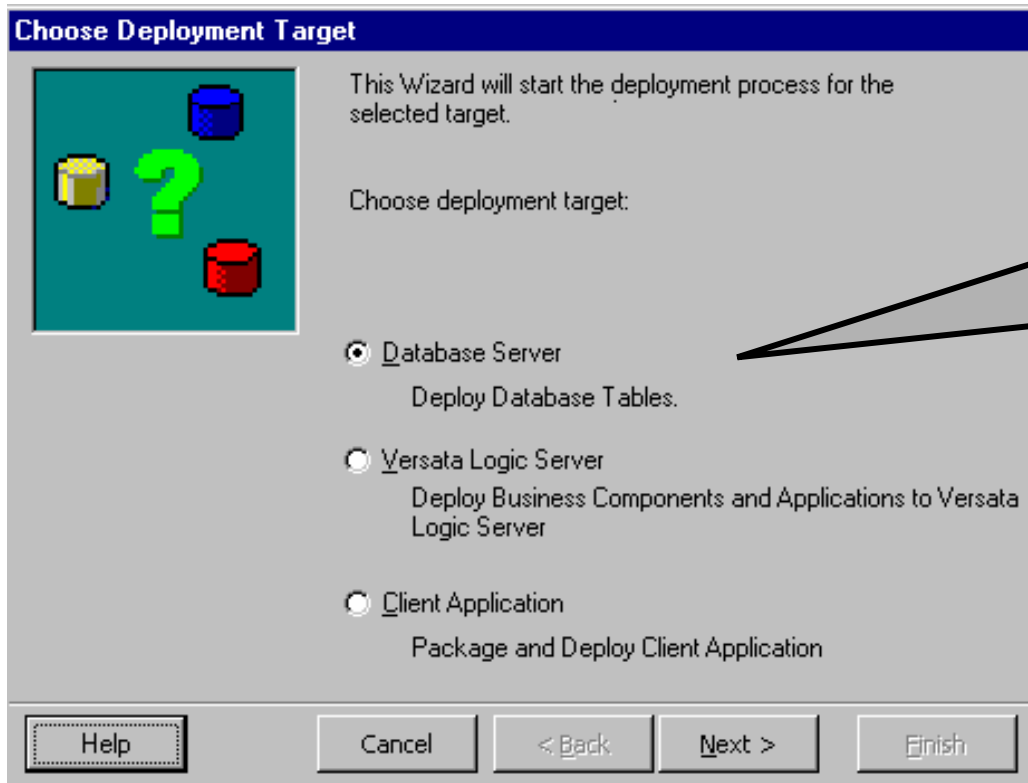
Deploying Compiled Classes



Directory Structure Recap



Deploying to the Database



This process will generate SQL that will be loaded to database (Oracle/DB2 etc.) to create or modify tables

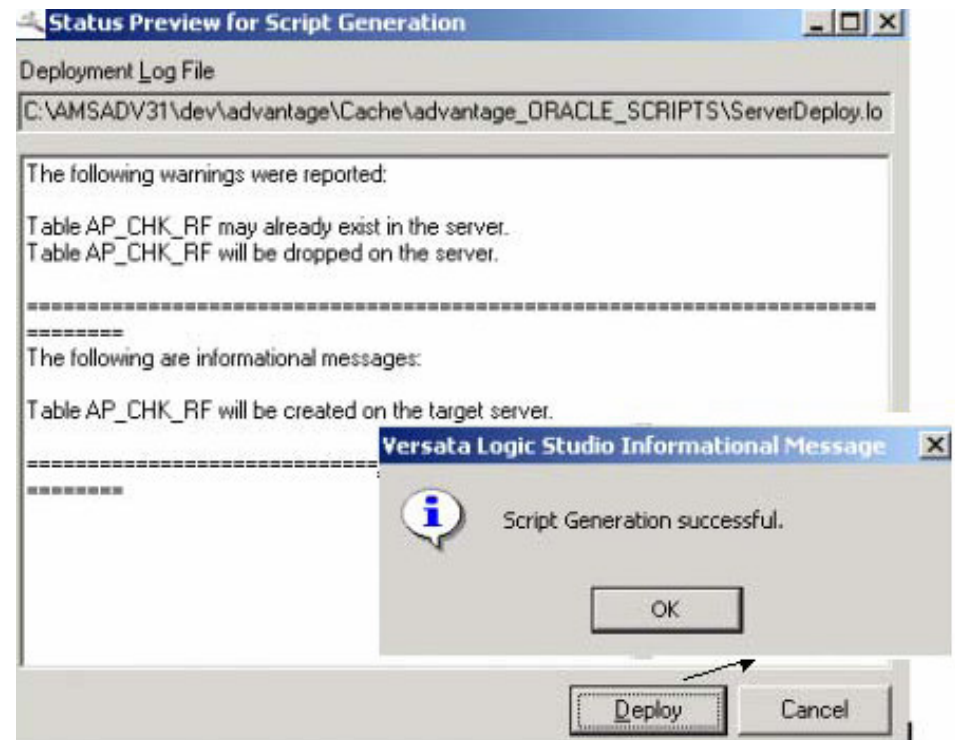
When? Database deployment needs to be done when a change to a data object affects the physical layout of the table

- New data object
- New attribute
- Deleted attribute
- Changed data type of attribute
- Change the requirement of an attribute

Deployment - Database

What is a Database deploy doing?

- Generating SQL Script that must then be executed to change the Database. Although the Studio can deploy directly to the DBMS, it is recommended that you generate the script.



Deploying to the Database (continued)

Server Manager Introduction

Choose the DBMS type you will be using for deployment.

- ☐ MS SQL Server
- ☒ Oracle
- ☐ Sybase
- ☐ Informix
- ☐ DB2UDB

Choose Database (Oracle)

Connect For Auto Selection

Would you like to auto-select changed data objects since the last deployment?

☐ Auto-select Data Objects

Do not select 'Auto-select Data Objects'

Hint

This option would let you compare the repository with a previous deployment on the server. If you cannot log into the server at this point, please uncheck this option.

All Data Objects

Data Objects To Deploy

R_NEW_REF_TBL

Choose your data object(s) to deploy

All Data Objects

Data Objects To Deploy

SR_DOC_MODAUTH
TM_DOC_HDR
TM_DOC_NOTE
TM_DOC_PROC
WF_APRV_LOG
WF_APRV_PROC_LOG
WF_APRV_SH
WF_APRV_WRK_LST
WO_DOC_ACTG
WO_DOC_HDR
WO_DOC_VEND
R_NEW_REF_TBL

Kentucky UNBRIDLED SPIRIT

eMARS Management Administrative & Reporting System

Deploying to the Database (continued)

e scripts

Do you wish to generate scripts instead of deploying directly to the server?

☐ Deploy to the Server

☒ **Generate Scripts for DDL**

☐ Transfer Test Data from Repository To Server

☐ Enforce Referential Integrity On DBMS

Do you wish to GRANT ALL permissions on the DBMS objects (Tables and stored procedures) to PUBLIC?

☒ **GRANT ALL Permissions to PUBLIC**

☐ Synchronize the repository with the server

☒ **Drop and recreate the data model**

Generate Scripts for DDL. This will cause an SQL file to be generated.

Do **not** enforce Referential Integrity at the database level (this is done through the application)

GRANT ALL Permissions

Drop and recreate the data model.

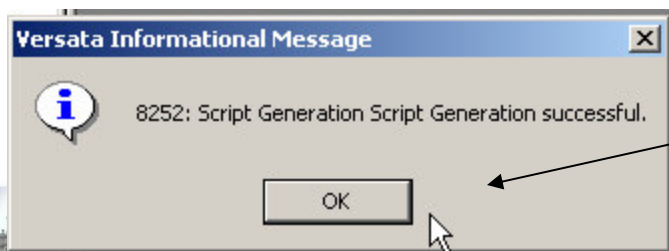
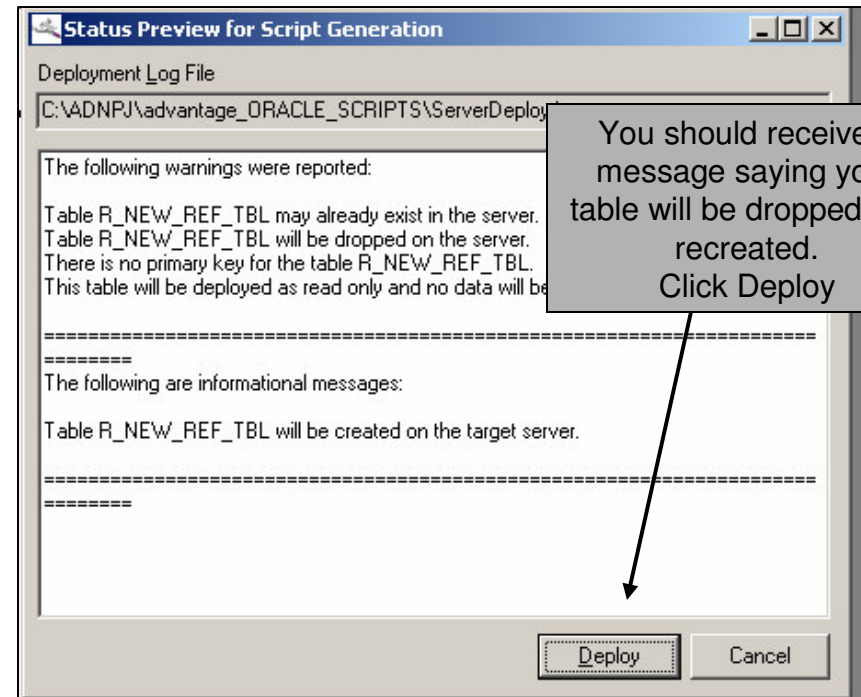
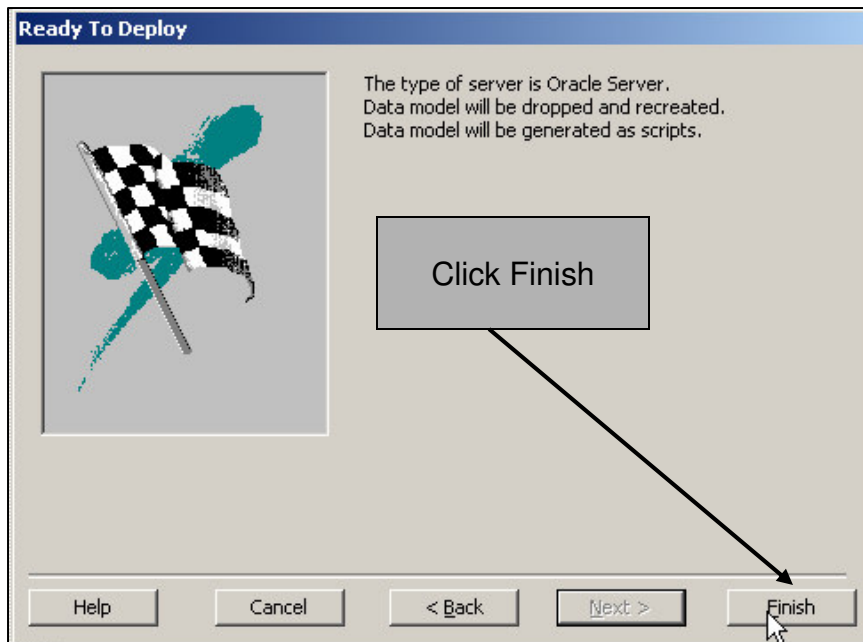
Click 'Next' to after setting the correct options on each step

Check if you have spaces and special characters in table/column names, or if you wish to preserve case sensitivity in Case Sensitive Servers.

☐ **Generate Quoted Identifiers**

Do not generate Quoted Identifiers

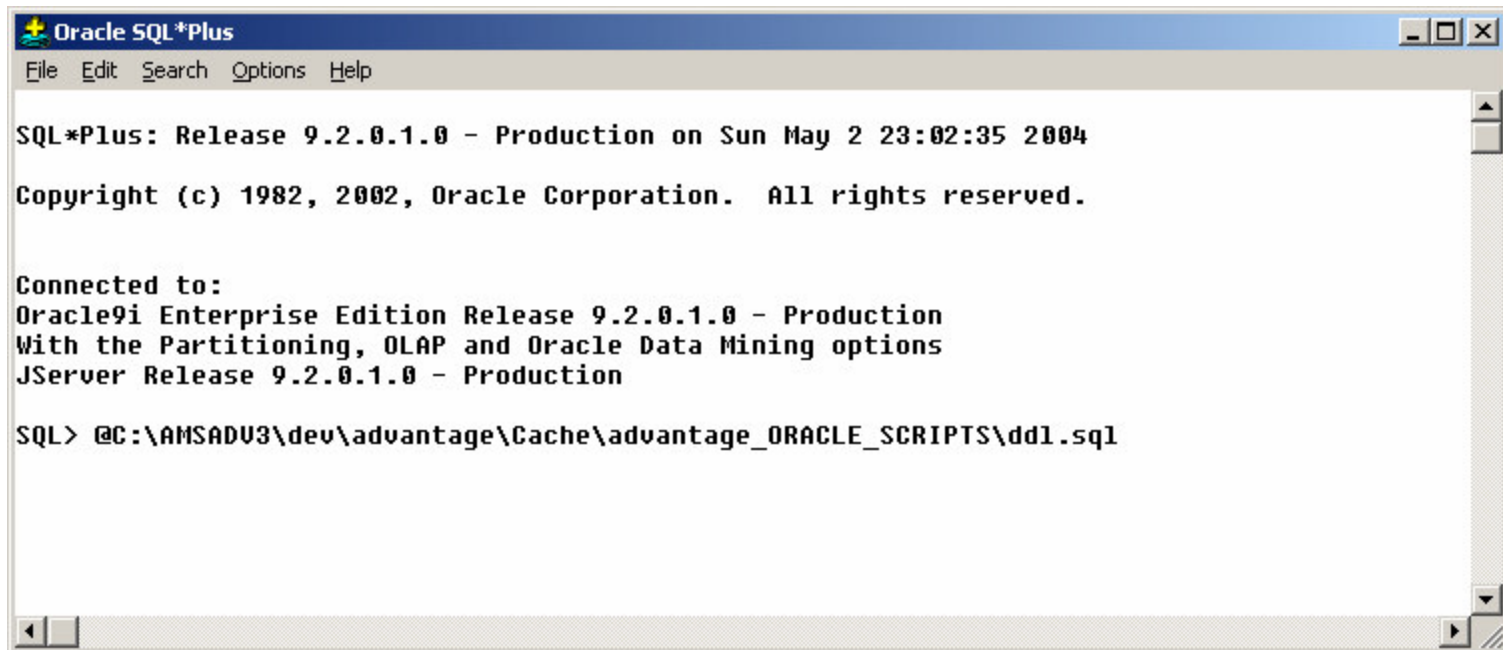
Deploying to the Database (continued)



You should receive this message letting you know the generation of the scripts was successful. Click 'OK' and then go find those scripts...

Running Database scripts

- After generating DDL.sql and RuleDDL.sql need to run them against the database.
- SQL+ can be used



```
Oracle SQL*Plus
File Edit Search Options Help

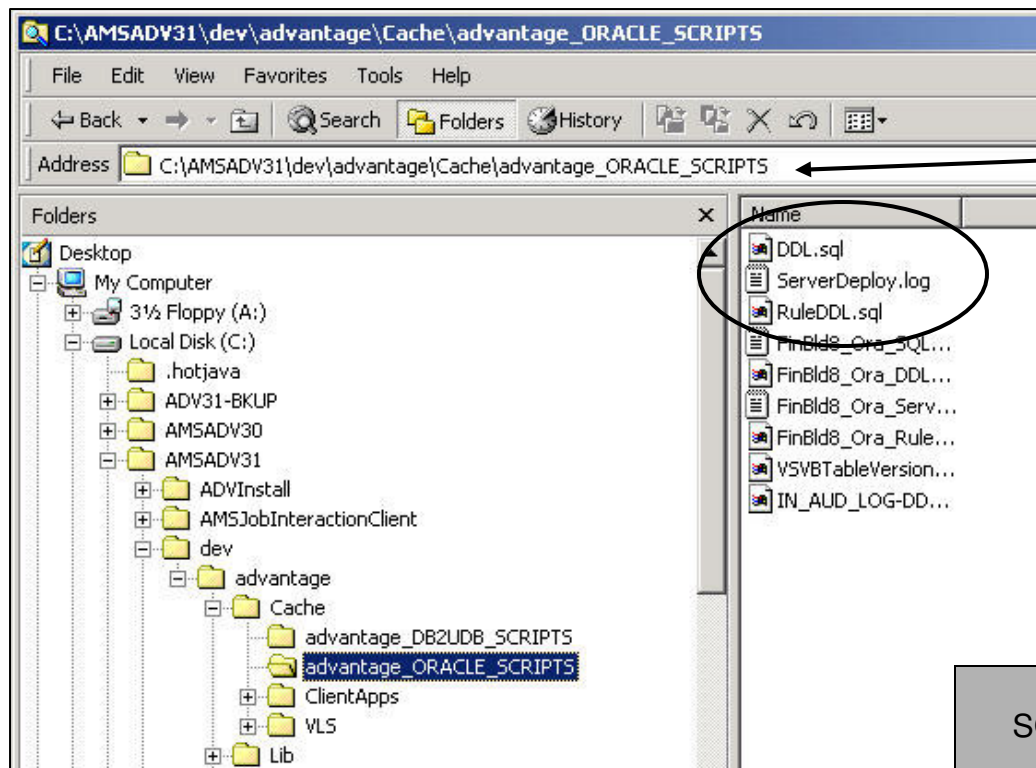
SQL*Plus: Release 9.2.0.1.0 - Production on Sun May 2 23:02:35 2004

Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.

Connected to:
Oracle9i Enterprise Edition Release 9.2.0.1.0 - Production
With the Partitioning, OLAP and Oracle Data Mining options
JServer Release 9.2.0.1.0 - Production

SQL> @C:\AMSADV3\dev\advantage\Cache\advantage_ORACLE_SCRIPTS\ddl.sql
```


Deploying to the Database (continued)



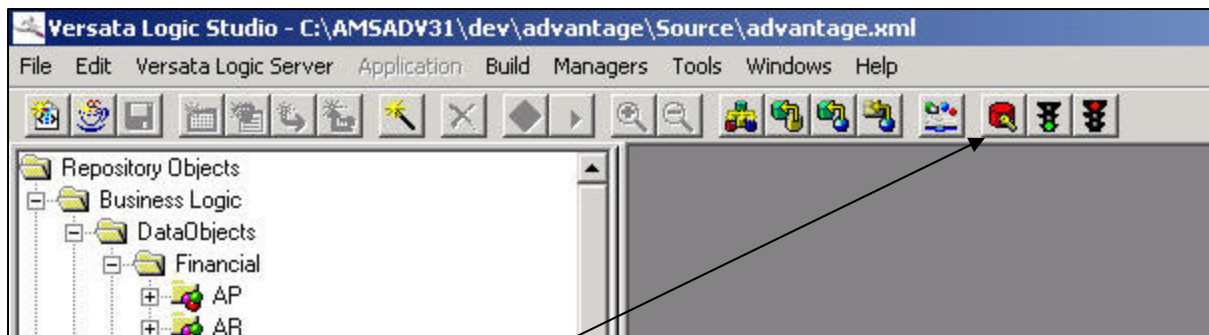
In the advantage_ORACLE_SCRIPTS directory, you should find the DDL.sql and RuleDDL.sql files. These contain sql commands that need to be executed on the database.

SQL commands can be executed against the database using:

- SQLPlus
- Dbsurfer
- Another database tool

VLS Console

After a VLS and Database Deploy of a *new* Data Object, it is necessary to do some configuration in the VLS Console.



VLS Console icon in the Versata Studio

Note: VLS must be running to open Console.

Logon Screen, press OK.

Registering New Objects in ADVANTAGE

The screenshot displays the Versata Logic Server Console interface. On the left, a tree view shows the hierarchy: Versata Logic Server > npowers-24557 > Administration (Ver. 57) > Data Servers > ADVSYST. A right-click context menu is open over ADVSYST, with 'Assign objects...' selected. The main pane shows the 'ADVSYST' data server properties, including 'Connection Properties', 'Data Server Type', 'Data Server Login', and a list of properties like 'Connection Idle Timeout', 'Connection Timeout', 'Country', 'External Data Source Name', and 'Host'. A secondary window titled 'Assign Business Objects to Data Server' is open, showing a list of objects assigned to the data server. A callout box points to the 'Assign objects...' menu item with the text: 'Right click on Data Server under Administration/DataServers, Select "Assign objects"'. Another callout box points to the 'Assign Business Objects to Data Server' window with the text: 'Select new Object not assigned, add them to Data Server, then save.' A third callout box points to the 'Objects Not Assigned to Data Server' section of the secondary window with the text: 'New Objects'. A large callout box at the bottom left contains the text: 'Assign Object to the configured Data Server. If more than one server is listed, the configured server contains connection properties, the unconfigured server does not.'

Versata Logic Server Console

ADVSYST

Connection Properties

Data Server Type

Data Server Login

Property

Connection Idle Timeout

Connection Timeout

Country

External Data Source Name

Host

Assign Business Objects to Data Server

ADVSYST

Objects Assigned to Data Server

advantage.ABS_DOC_ACTG

advantage.ABS_DOC_HDR

advantage.ABS_DOC_VEND

advantage.AD_DOC_ACTG

advantage.AD_DOC_HDR

advantage.AD_DOC_VEND

advantage.ALOT_STRU_10_LVL_1

advantage.ALOT_STRU_10_LVL_2

advantage.ALOT_STRU_12_LVL_3

advantage.ALOT_STRU_12_LVL_5

advantage.ALOT_STRU_1_LVL_1

advantage.ALOT_STRU_1_LVL_4

advantage.ALOT_STRU_25_LVL_1

advantage.ALOT_STRU_25_LVL_2

Objects Not Assigned to Data Server

New Objects

Select new Object not assigned, add them to Data Server, then save.

Right click on Data Server under Administration/DataServers, Select "Assign objects"

Assign Object to the configured Data Server.
If more than one server is listed, the configured server contains connection properties, the unconfigured server does not.

Assign Privileges to New Objects

The screenshot shows the Versata Logic Server Console interface. On the left, a tree view displays the hierarchy: Versata Logic Server > npowers-24557 > Administration (Ver. 57) > Roles > Public. The 'Public' role is selected. The main pane shows the 'Public' role configuration with tabs for Privileges, Users, and Properties. The 'Business Objects' tab is active, showing a list of objects with columns for Read, Create, Update, and Delete privileges. The 'advantage.AD_DOC_ACTG' object is highlighted. A context menu is open over this object, showing options: Grant Read, Grant Create, Grant Update, Grant Delete, Grant All, and Remove All. The 'Grant All' option is selected. A callout box points to the 'Business Objects Tab' and another points to the 'Grant All' button. A large text box on the right explains that once a new object is registered with the VLS, access rights must now be assigned. The bottom left corner features the eMARS logo and text: 'eMARS Management Administrative & Reporting System'. The bottom right corner features the 'UNBRIDLED SPIRIT' logo.

Business Objects Tab

Once a new Object is registered with the VLS, access rights must now be assigned.

Privileges can be assigned under Administration\Roles\Public

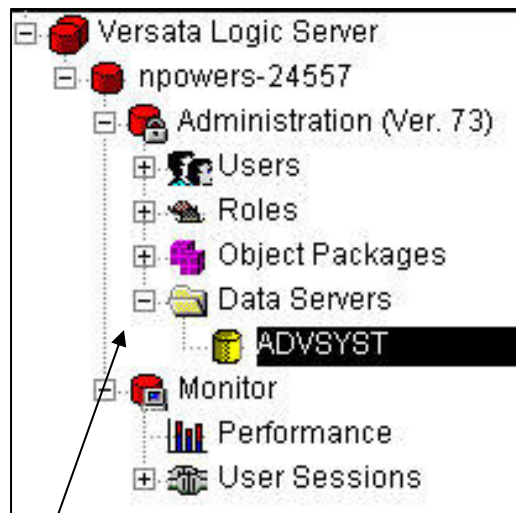
Object Name	Read	Create	Update	Delete
advantage.ABS_DOC_ACTG	✓	✓	✓	✓
advantage.ABS_DOC_HDR	✓	✓	✓	✓
advantage.ABS_DOC_VEND	✓	✓	✓	✓
advantage.AD_CR_MMO_REC_SEL	✓	✓	✓	✓
advantage.AD_DOC_ACTG				
advantage.AD_DOC_HDR	✓	✓	✓	✓
advantage.AD_DOC_VEND	✓	✓	✓	✓
advantage.AD_PYMT_SLCT	✓	✓	✓	✓
advantage.AGCY_PER	✓	✓	✓	✓

Click "Grant All" for Read, Create, Update and Delete. Or select new object from the list and check rights manually.

eMARS Management Administrative & Reporting System

UNBRIDLED SPIRIT

VLS Console Data Server Properties



Data Servers,
multiple can be listed.

Data Server Properties

Connection Properties | Data Objects | Data Server Login Override

Data Server Type: Oracle-JDBC Thin Client

Data Server Login: npowers Password...

Property	Value
Connection Idle Timeout	1800
Connection Timeout	1
Country	
External Data Source Name	
Host	wells
In_Trans_Isolation_Level	2
Language	

Property Description

Specifies the maximum time in seconds that an idle (unallocated) connection can remain in the pool before being removed to free resources. This value must be a positive integer.

Test Connection

Important properties:
Type, Login, Password, Host,
Schema, and SID.

Once configured, the
connection to the database
can be easily tested.

Stop and Start Websphere



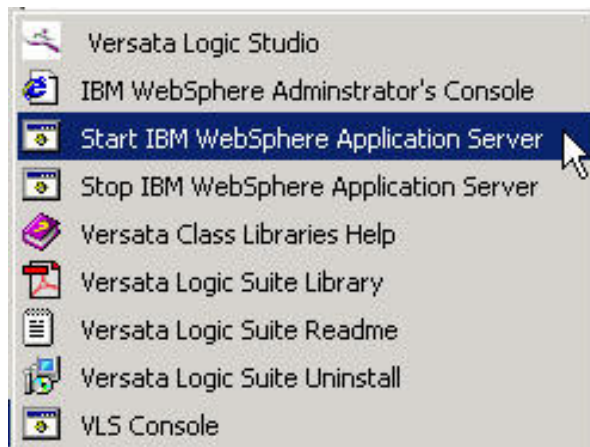
In order for the changes to take place, the server must be restarted. Click the green light in the Versata toolbar.

```
C:\WINNT\System32\cmd.exe
C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar;C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\i18n.jar;C:\AMSAPPS\WEBSPH~1\APPSER~1\java\lib\tools.jar" -Dws.def.olt.host=localhost -Dws.def.olt.port=2102 -Dws.def.jdwp.port=7777 -Dws.ext.dirs="C:\AMSAPPS\WebSphere\AppServer\java\lib;C:\AMSAPPS\WebSphere\AppServer\lib;C:\AMSAPPS\WebSphere\AppServer\classes;C:\AMSAPPS\WebSphere\AppServer\lib;C:\AMSAPPS\WebSphere\AppServer\lib\ext;C:\AMSAPPS\WebSphere\AppServer\web\help;C:\oracle\ora81\jdbc\lib\classes12.zip;C:\oracle\ora81\jdbc\lib\classes12.zip" "-Dcom.ibm.CORBA.ConfigURL=file:/C:/AMSAPPS/WebSphere/AppServer/properties/sas.server.props" com.ibm.ws.bootstrap.WSLauncher com.ibm.websphere.install.commands.ProcessLauncherTest -configFile "C:\AMSAPPS\VersataD\config\versata-cfg.xml"

WebSphere Application Server, Advanced Single Server Edition U4.0
Application Server Launcher
Copyright (C) IBM Corporation, 2001

The configuration file was accepted as:
  C:\AMSAPPS\VersataD\config\versata-cfg.xml
Using the single available node or the localhost node.
Using the single available server.
Initiating server launch.
Loaded domain "WebSphere Administrative Domain".
Selected node "npowers-24557".
Selected server "VERSATA".
WSPL0065I: Initiated server launch with process id 1952.
```

Bouncing the VLS Console



Clicking “Start IBM WebSphere Application Server” will run a script to stop the server, then restart it.

To start and stop the VLS Console outside the studio:
Start Menu – Program Files - Versata Logic Suite 5.5 - WebSphere Edition

This has a shortcut that will allow you to restart the server, as well as a shortcut to the VLS Console.

Deployment Review – 3 Types

3 Types of Deployment

- **Database Deployment**
 - New Data Objects (tables)
 - Changes to physical layout of existing Data Objects (e.g. adding 'persistent' fields, changing field lengths, field types.
 - Generates SQL Scripts
- **VLS Deployment**
 - New Data Objects or Query Objects
 - Changes to existing Data Objects or Query Objects
- **Client Deployment**
 - New pages
 - Changes to existing pages.

Hands-on Familiarization Session (End User's Perspective)

AMS ADVANTAGE® 3
Application Development

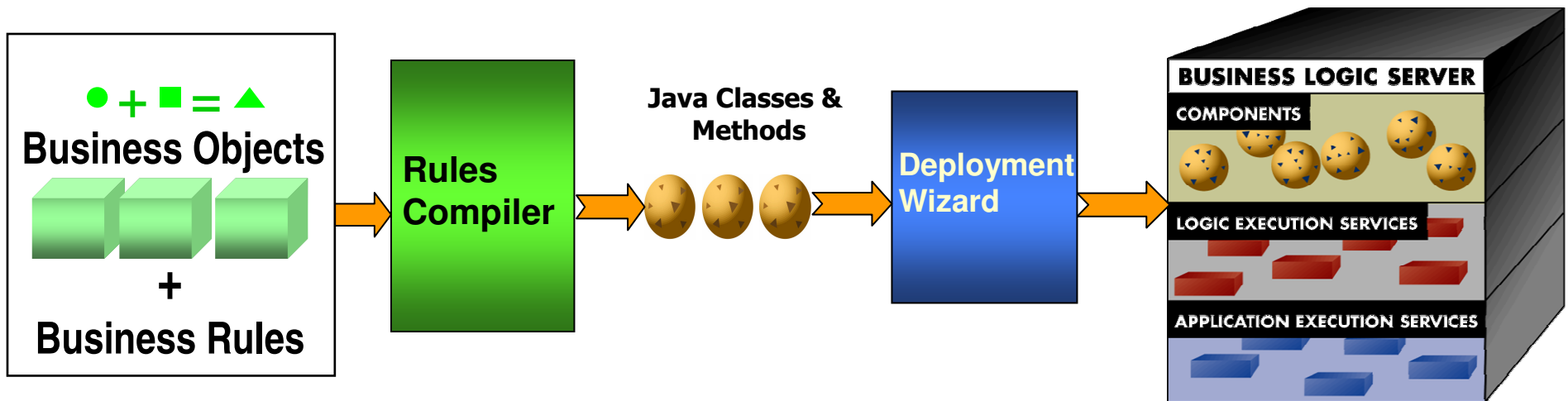


ADVANTAGE Application Software is Automatically Deployed From the Repository (recap)

1.
**Design Business Objects
& Business Rules in the
Design Studio**
(Optionally add custom
Java code as necessary)

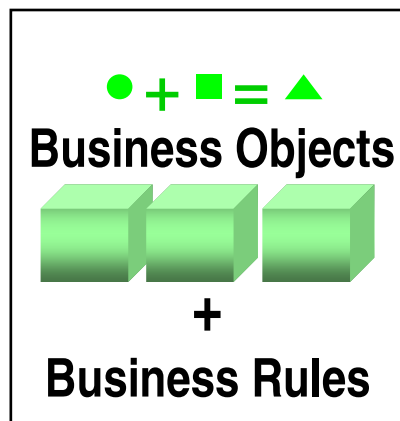
2.
**Compile Objects
and Rules into
Java classes**

3.
**Deploy Java classes to
VLS**



Database Deployment Process

Design Studio



Generate

DDL Statements

Supported Relational Database



Update

Configuration and Customization (recap)

- Setup and configuration
- ADVANTAGE Studio
 - Define data model and business rules
 - Create/modify business objects
 - Code business rules at an abstract level
 - Code by exception: Some Java in special cases
 - Deploy
 - Generate DDL and deploy to the database
 - Compile and deploy 100% Java business objects within the business logic server environment

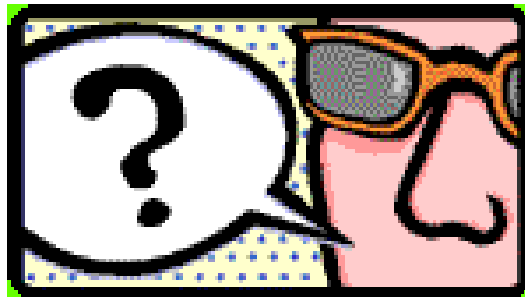


Typical Development Path

- ☐ Reserve files in CM tool (Checkout/Lock)
- ☐ Create/Update Business Objects
- ☐ Build/rebuild java code
- ☐ Add custom code to generated java file
- ☐ Compile
- ☐ Deploy to Versata Logic Server (VLS)
- ☐ Deploy to Database
- ☐ Create/update application pages
- ☐ Build/rebuild java and html

- ☐ Apply/reapply custom html if necessary
- ☐ Add/update custom java code if necessary
- ☐ Compile
- ☐ Deploy to the Client
- ☐ Start web server
- ☐ Start application server
- ☐ Test/Debug
- ☐ Check in updated files into CM tool

Questions!



Break

AMS ADVANTAGE® 3
Application Development

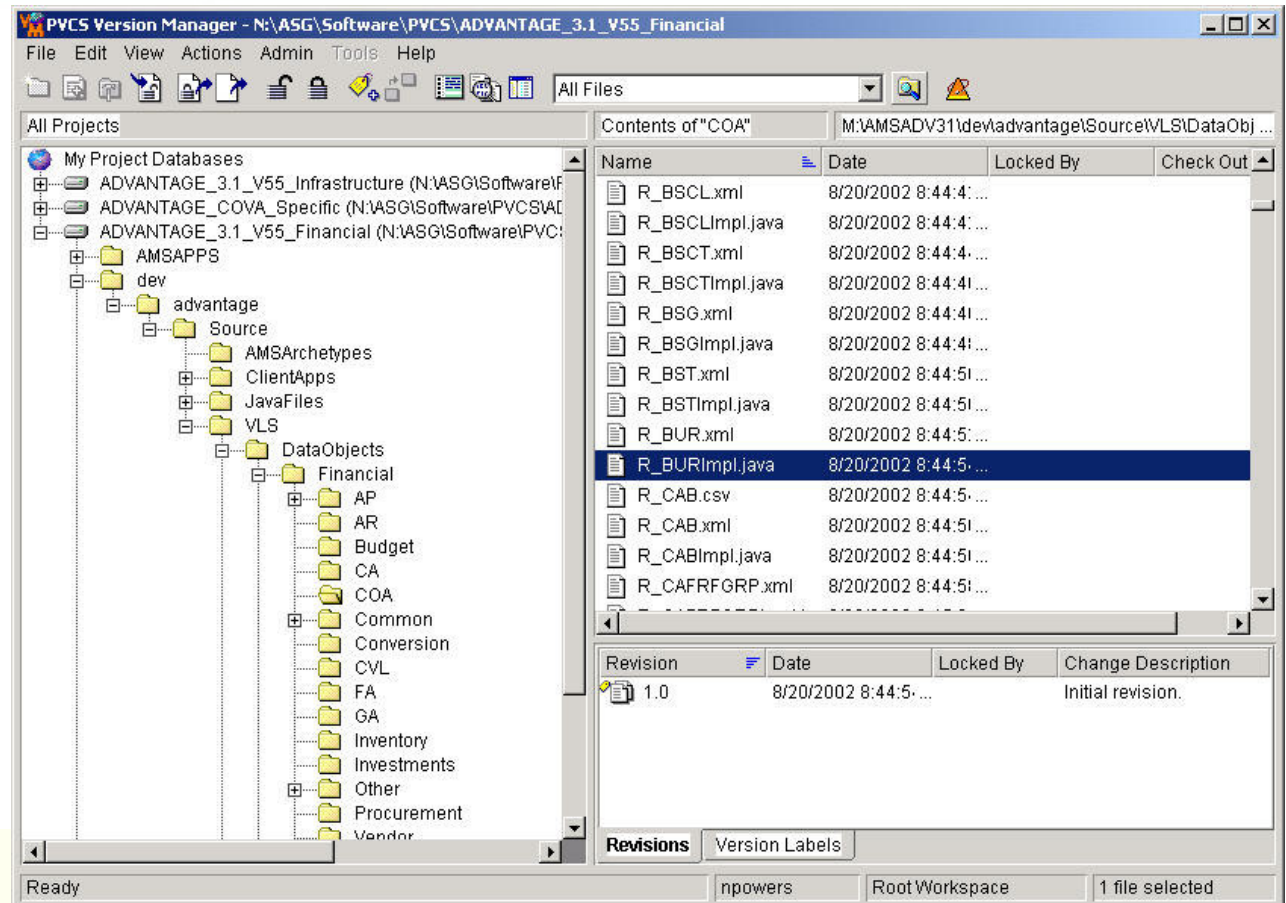
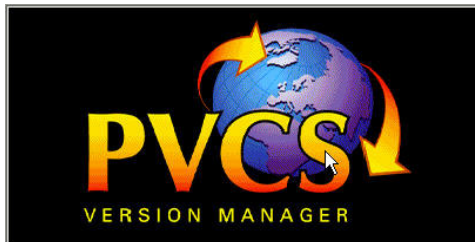


Development Tools

AMS ADVANTAGE® 3
Application Development



PVCS



About Version Manager

PVCS Version Manager is one component of the PVCS family of software configuration management tools. Software configuration management enables any member of a development team to retrieve and build any version of an application at any time in a consistent, repeatable manner.

Version Manager records all changes to a software system with details about who made a change, when, and why. With Version Manager you can retrieve any prior revision easily, and be assured that files won't be inadvertently overwritten. While you have a file checked out, Version Manager prevents other users from making changes to that file.

DB Surfer

DB Surfer

File Rows Display Window Help

Data Browse : npowers (Oracle - NPOWERS)

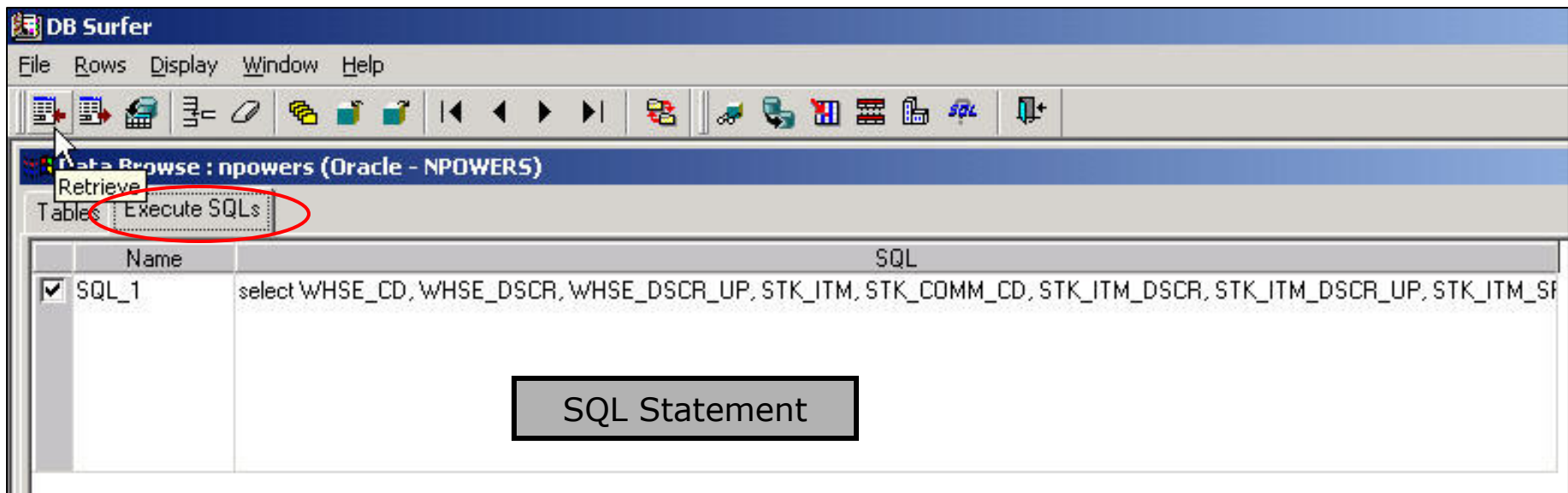
Tables Execute SQLs

cvl_wkly_choc	ev_doc_socommln	in_appsrv_lst	in_sys_st_log	jrn_comp	ma_doc_authdept	po_doc_actgdist	r_ap_clm_typ	r_bly_stdv_rev	r_caftrtyp	r_cty
cvl_wo_gen	ev_doc_srcommgp	in_arch_stor	in_user_profile	jrn_fa	ma_doc_comm	po_doc_comm	r_ap_disb_cat	r_bly_stdv_spnd	r_cash_sw_setp	r_cus
cvl_wo_sta	ev_doc_srcommln	in_aud_log	in_user_wkgrp	jrn_int	ma_doc_hdr	po_doc_hdr	r_ap_disb_excp	r_bly_stpf	r_caunit	r_cus
cvl_wty_typ	F	in_aud_log_ctl	in_wkgrp	jrn_ldgr_xref	ma_doc_mewper	po_doc_spis	r_ap_disb_fmrt	r_bly_stpf_bsa	r_cbal	r_cus
cvl_yes_no	fa_doc_actg	in_ba	in_wksp	jrn_log	ma_doc_subvend	po_doc_subvend	r_ap_disb_hld_reas	r_bly_stpf_nactg	r_cbal_aud	r_dc
D	fa_doc_comm	in_bf	inct_disb_rqst	jrn_log_det	ma_doc_tccomm	po_doc_tccomm	r_ap_disb_parm	r_bly_stpf_rev	r_cc_typ	r_def
dc_doc_actg	fa_doc_hdr	in_bf_item	inf_appr	iv_doc_actg	ma_doc_tclist	po_doc_tclist	r_ap_disb_prty	r_bly_stpf_spnd	r_cert_insr	r_def
dc_doc_vend	faapl	in_bo_user_sync	inf_bfy	iv_doc_hdr	ma_doc_vend	po_doc_vend	r_ap_disb_rqst	r_bly_stpf_stg	r_chrg_cls	r_def
doc_actg	fapr	in_category	inf_dept_unit	iv_doc_lngrp	match_sta_awd	pr_doc_actg	r_ap_disb_rqst_ln	r_bly_stpf_stg_ln	r_cl_mgmt_inst_hdr	r_det
doc_coa	fashell	in_doc_arch_att	inf_fprl_1	L	match_sta_awd_ln	pr_doc_actgdist	r_ap_disbcan_parm	r_bid_dps	r_cl_mgmt_inst_ln	r_disl
doc_comm	fin_chrg_excp_tmpr	in_doc_arch_ctlg	inf_fprl_2	ldgr_001	match_sta_inv	pr_doc_comm	r_ap_disbcorr_parm	r_bill_inst	r_clagcy_agrmt	r_div
doc_comm_invr	fsl	in_doc_arch_ctlg	inf_fprl_3	ldgr_002	match_sta_inv_hdr	pr_doc_hdr	r_ap_dps_excp	r_bill_rt	r_cldt	r_dng
doc_disc	G	in_doc_comp_log	inf_fund_func_actv	ldgr_003	match_sta_pymt	pr_doc_vend	r_ap_dps_recon	r_bond	r_cmia_intr_parm	r_dot
doc_err_oflow	gn_alot_opt	in_doc_crea_actn	inf_phase_prog	ldgr_004	match_sta_recv	prcu_exprt	r_ap_evt_typ_xwk	r_bpro	r_cmjrbgrp	r_dor
doc_hdr	gn_bud_lv	in_doc_hdr	invn_po_temp	ldgr_005	md_doc_actg	prcu_ma_srch	r_ap_hdlg_cd	r_bs_catalog	r_cmnrgrp	r_dor
doc_hdr_invr	gn_bud_lv_lnk	in_doc_vend	invn_rq_temp	ldgr_006	md_doc_hdr	prcu_po_srch	r_ap_inct_rqst	r_bs_catalog_temp	r_cntac	r_dor
doc_hist	gn_bud_rule	in_fav	invn_srj_temp	ldgr_007	md_doc_vend	pstng_ln_cat	r_ap_pd_prcu_tran	r_bsa	r_cntrc_asgn	r_dor
doc_int_coa	gn_bud_stru	in_hmpg_winn	invn_tj_temp	ldgr_008	N	R	r_ap_prcu_card_adm	r_bsa_cbal	r_cnty	r_dor
doc_ov_log	gn_fund_cnst	in_if_frm_tran	ita_doc_actg	ldgr_009	nyti_proc_info	r_abal	r_ap_spec	r_bsa_cbal_aud	r_coa_crosswalk	r_dor
doc_payee	gn_in_cnst	in_if_tran_fds	ita_doc_hdr	ldgr_010	O	r_abc	r_ap_spec_fund	r_bsa_fbale	r_coll_ctrl	r_dor
doc_vend	gn_lnk	in_if_tran_order	ita_doc_vend	ldgr_apd_actg	oc_doc_actg	r_acat	r_ap_uproc_prcu	r_bscl	r_coll_ctrl_det	r_dor
E	gn_lnk_hist	in_if_tran_rel	iti_doc_actg	ldgr_apd_ca	oc_doc_actgdist	r_acsls	r_apcat	r_bsct	r_coll_ltr	r_dor
ev_doc_bdtab	gn_lv_cnst	in_leaf	iti_doc_hdr	ldgr_bfytd_actg	oc_doc_comm	r_actg_tmpl	r_apcls	r_bsg	r_coll_rfrl_inpt	r_dor
ev_doc_ecgp	gn_lv_lnk_bkt	in_ln_srch	iti_doc_vend	ldgr_bfytd_ca	oc_doc_hdr	r_actv	r_apd	r_bst	r_comm_cd	r_dor
ev_doc_eclst	I	in_node	iv_doc_actg	ldgr_fydad	onln_prm_bat_parm	r_ad	r_apd_fund	r_bur	r_comm_fa_thld	r_dor
		in_obj_att_ctlg	iv_doc_hdr	ldgr_fytd_actg	P	r_adj	r_apgrp	r_buys	r_comm_hist	r_dor
						r_ad_reas	r_appr	r_buys_fline	r_comm_obj	r_dot
						r_agrp	r_aptyp	r_buys_perf_cmnts	r_cond	r_drs
						r_alt_org_struct	r_atyp	r_buys_perf_cmplx	r_corspd	r_drs
						r_ambist	r_auto_apy_temp	r_buys_perf_mng	r_cr_bal_det	r_drs
						r_ap_bank_acct	r_bbal_fy_details	r_buys_perf_type	r_csal_ctrl_setp	r_drs
						r_ap_chk_excp	r_bbal_id	r_buys_team	r_csal_srcr_setp	r_drs
						r_ap_chk_recon	r_bly_stdv_bsa	r_cab	r_csal_stpctr_setp	r_dst
						r_ap_clm_acct	r_bly_stdv_nactg	r_caftrgrp	r_ctry	r_ev

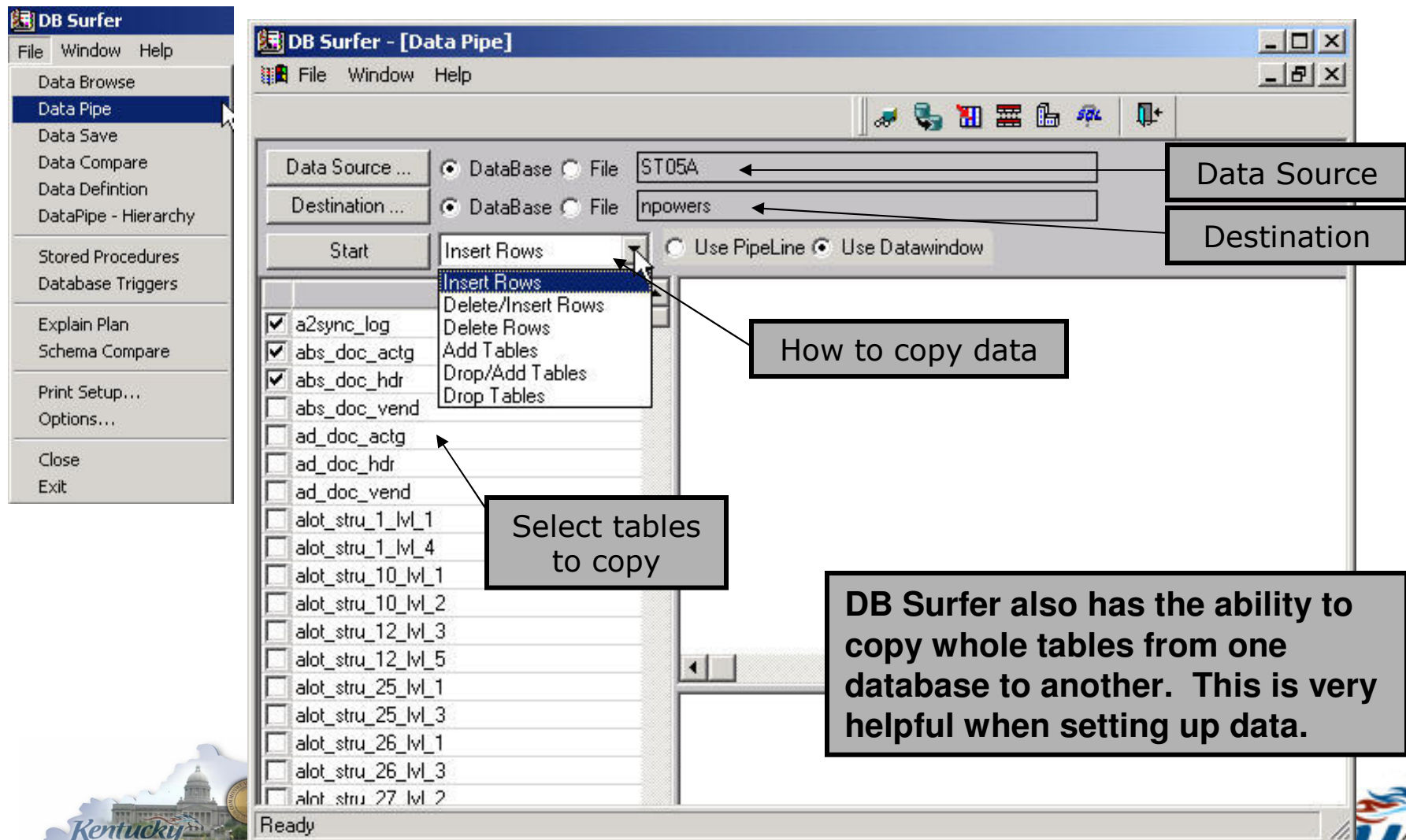
DB Surfer is a tool that allows users to directly look at a database without knowing specific Oracle or SQL commands. It connects to a specified database and lists the tables that make up the database. Users can then look at each table to see the data.

DB Surfer – Running SQL Statements

DB Surfer can also execute SQL statements against the database. This can be very beneficial when debugging. The SQL statements can be taken from the VLS console and pasted into DB Surfer to get the exact records returned.

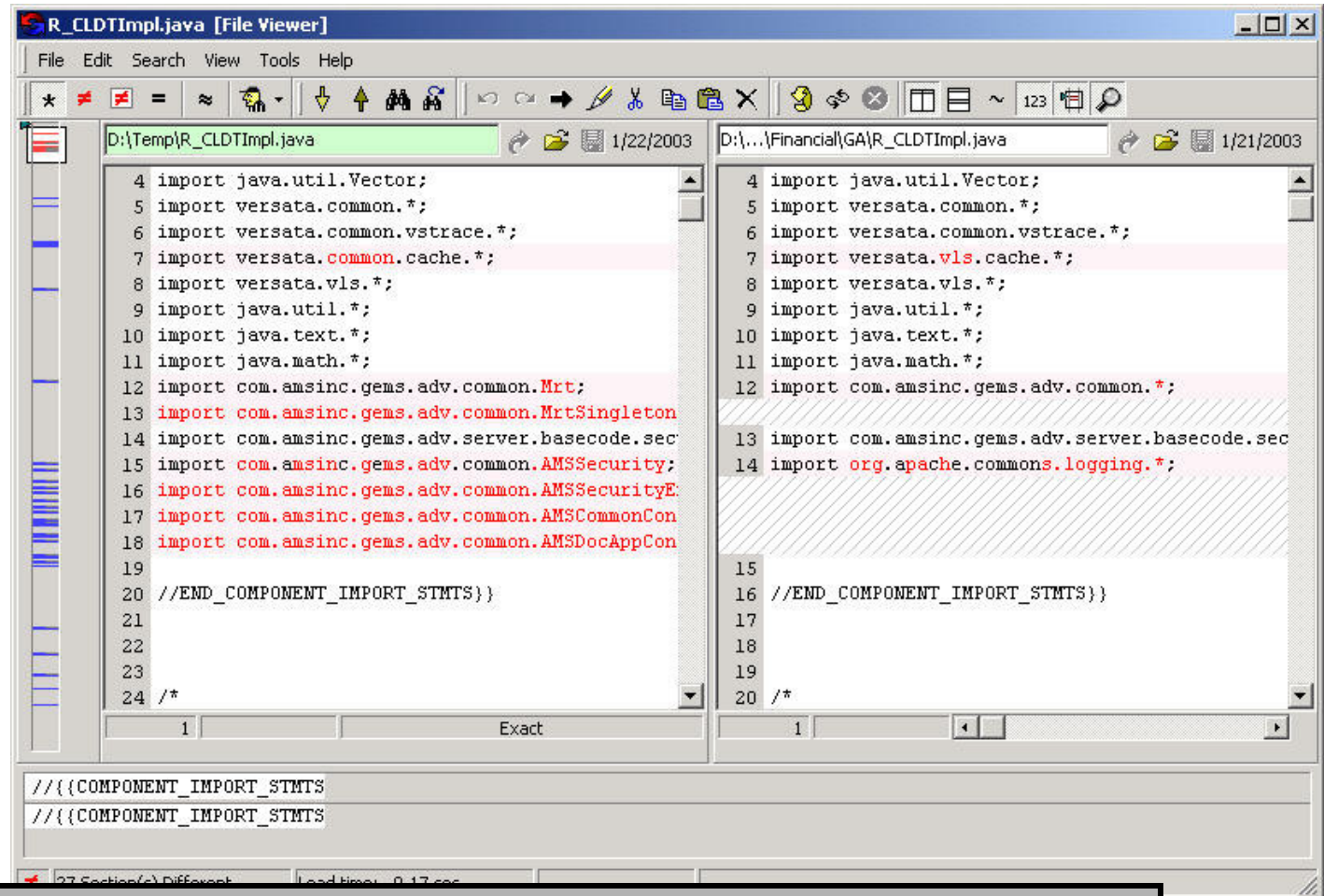
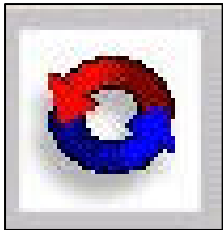


DB Surfer – Data Pipe



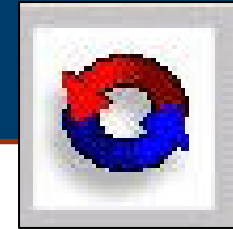
DB Surfer also has the ability to copy whole tables from one database to another. This is very helpful when setting up data.

Beyond Compare



Beyond Compare is a utility for comparing things. Things like text files, folders, zip archives, FTP sites, etc. Use it to manage source code, keep folders in sync and compare program output.

Beyond Compare



Explore

- Open
- Browse with ACDSee
- Command Prompt Here
- Search...
- Scan for Viruses
- Add to Winamp's Bookmark list
- Enqueue in Winamp
- Play in Winamp
- Select Left Side to Compare**
- Sharing...
- WinZip
- Send To
- Cut
- Copy
- Paste
- Create Shortcut
- Delete
- Rename
- Properties

Explore

- Open
- Browse with ACDSee
- Command Prompt Here
- Search...
- Scan for Viruses
- Add to Winamp's Bookmark
- Enqueue in Winamp
- Play in Winamp
- Compare to "VLS"**
- Select Left Side to Compa
- Sharing...
- WinZip
- Send To
- Cut
- Copy
- Paste
- Create Shortcut
- Delete

To compare files or folders, right click on the first object and select "Select Left Side to Compare". Right click on the second object and select "Compare to <Object>". This will bring up a new window with the differences.

Hands-on Exercises



- Exercise 1

AMS ADVANTAGE[®] 3

Application Development

Day 2: Creating HTML Pages in the
ADVANTAGE Studio



Objectives for the Day

- Understand Standardized Data Objects
- Understand how Objects get incorporated into the ADVANTAGE application
- Gain a working knowledge of the files and directory structure for HTML Applications
- Learn how to create a new HTML page in the development Studio
- Learn how to deploy new HTML pages
- Use the Versata Studio to create an HTML page and register it with the application

Today's Agenda

Morning

- Review
- Standardized Data Objects
- Introduction to HTML Applications
- HTML Application Directory Structure and Files
- Building HTML client applications
- Deploying HTML client applications

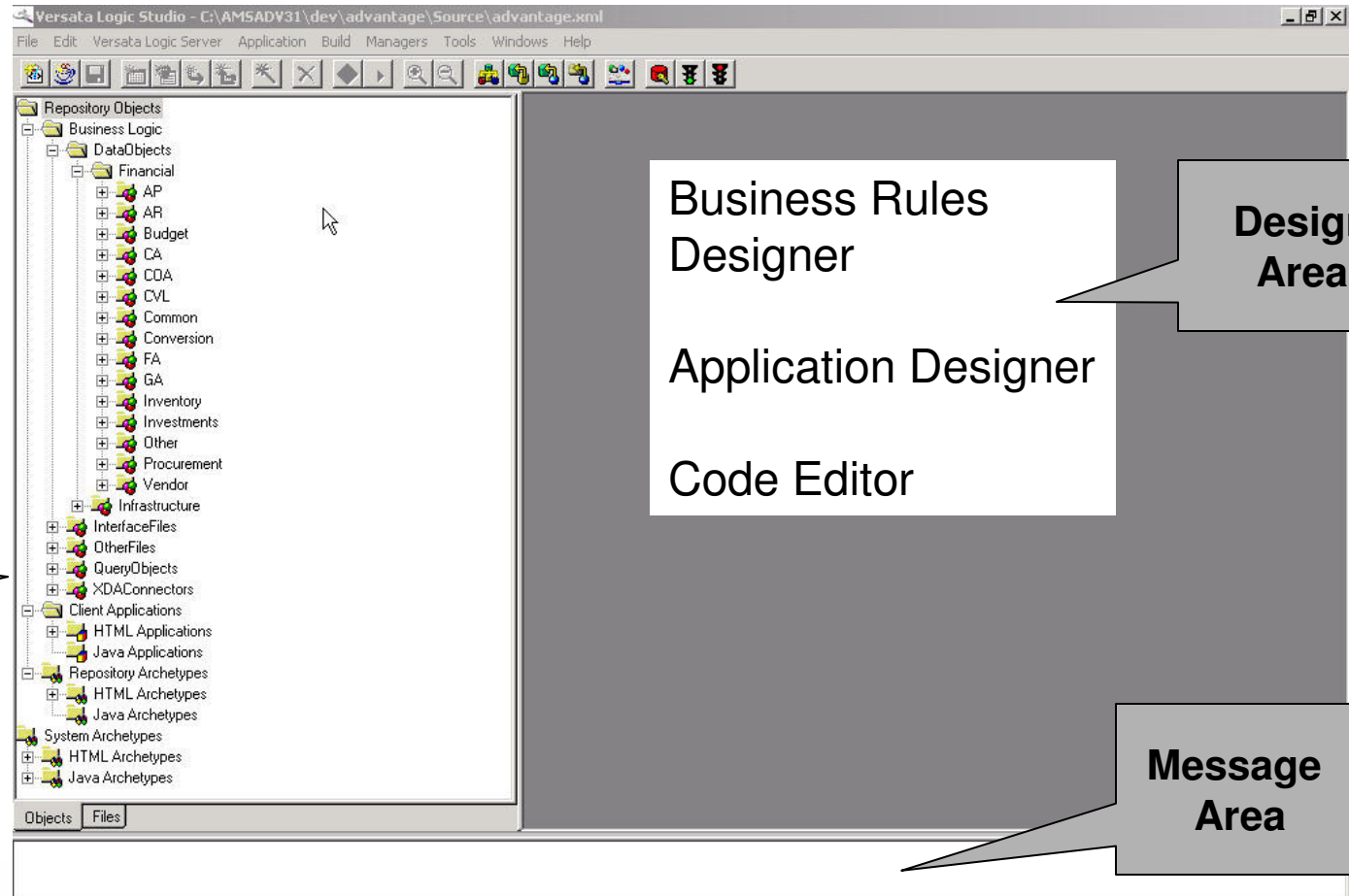


Afternoon

- 👤 ● Recap with questions and answers
- Self-paced exercises



Development Studio



Repository Objects

4 Primary types of objects in ADVANTAGE

- Data Objects
- Query Objects
- Pages (Includes documents, reference pages, activity folders)
- 'OTHER FILES' Java Programs

Advantage.xml

```
<DataObjects>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG</DataObject>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG_CTL</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BF_ITEM_ST</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_JOB_PRTY</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_NODE_TYPE</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_RUNPOLICY</DataObject>

<QueryObjects>
  <QueryObject>QueryObjects\Infrastructure\DocEngine\OBJ_ATT_ALT_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\FormsPrinting\PRNT_JOB_SRV_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_FLDR_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_TBL_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\VIEW_ALL_JOBS_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\Navigation\q_InPages</QueryObject>

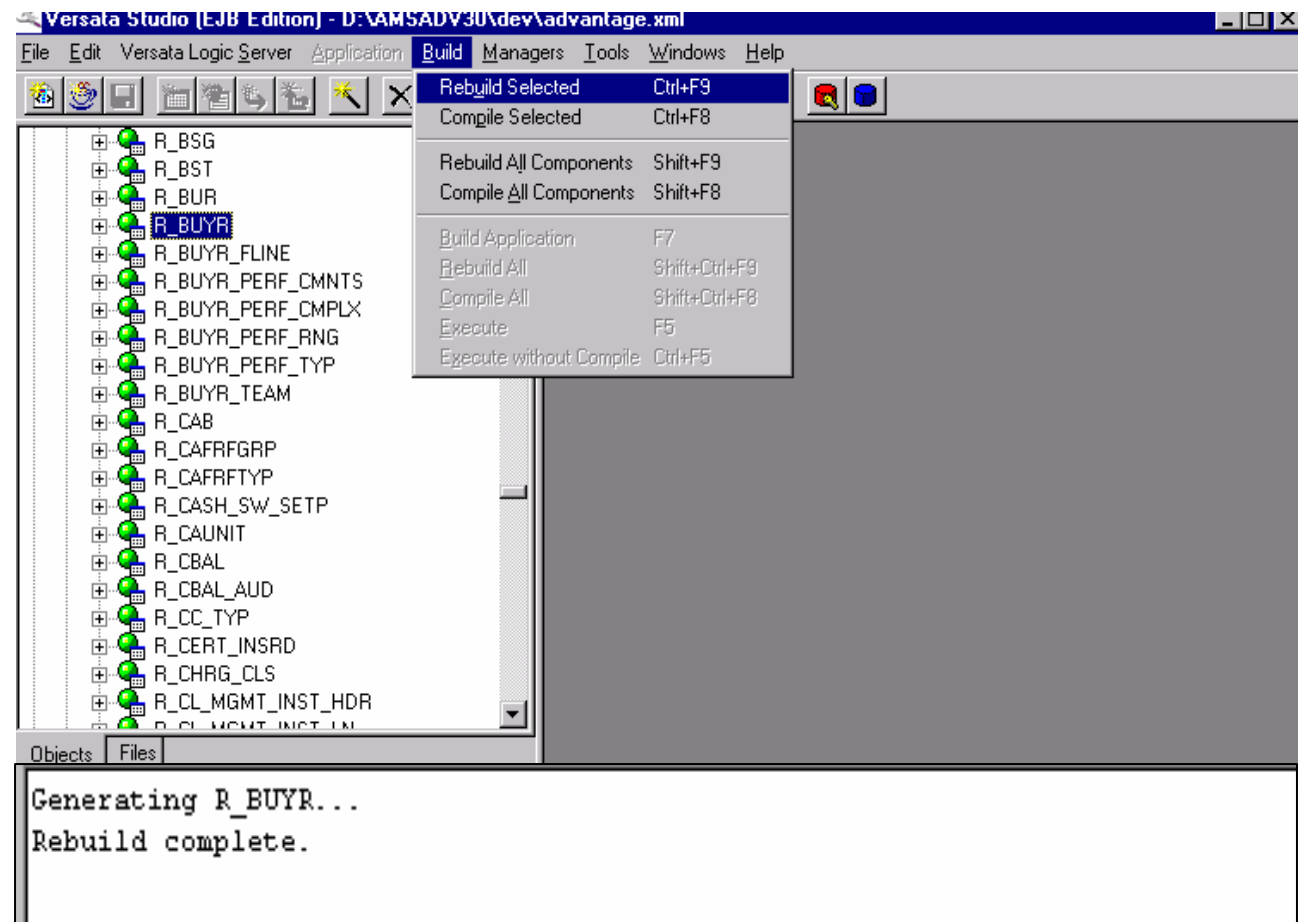
<Relationships>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-IN_DOC_CREA_ACTN</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_SC_USER_DOC_COMP</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV_COMP</Relationship>

<HTMLApplications>
  <Application>Advantage</Application>
  <Application>GenMRT</Application>
  <Application>PasswordReset</Application>
  <Application>Prototype</Application>
```

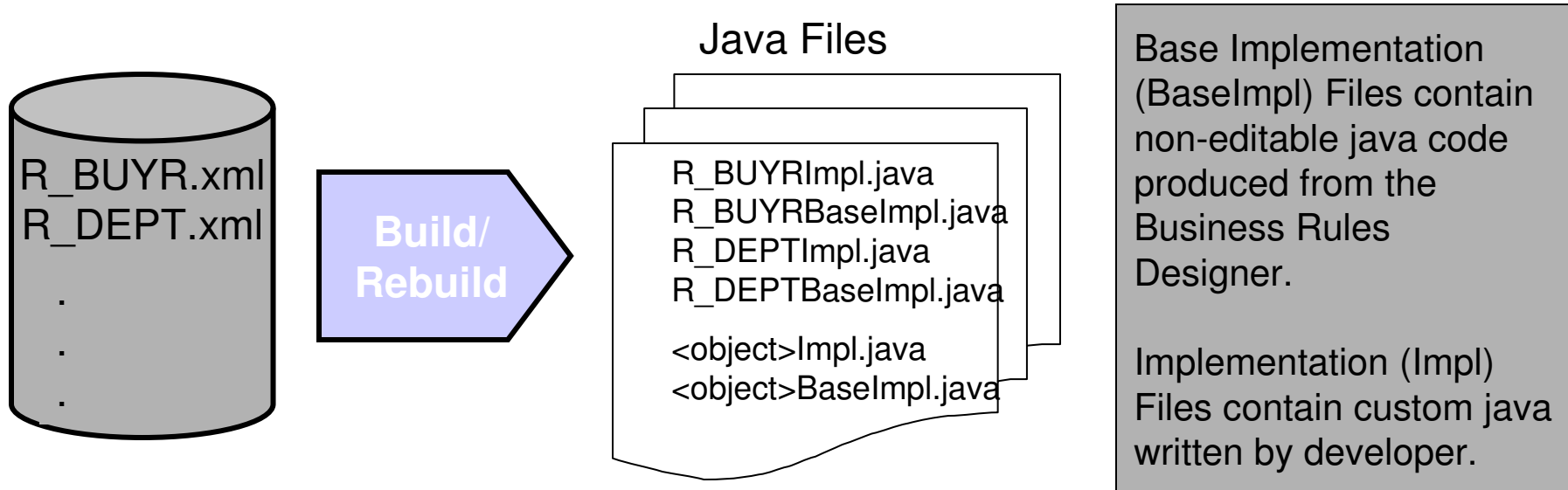
Rebuilding the Data/Query Object

First select the object and then choose 'Rebuild Selected' option from Build menu.

Message area tells you when the action is complete



Building Java Files from Data/Query Objects



Where are these files stored on my computer?

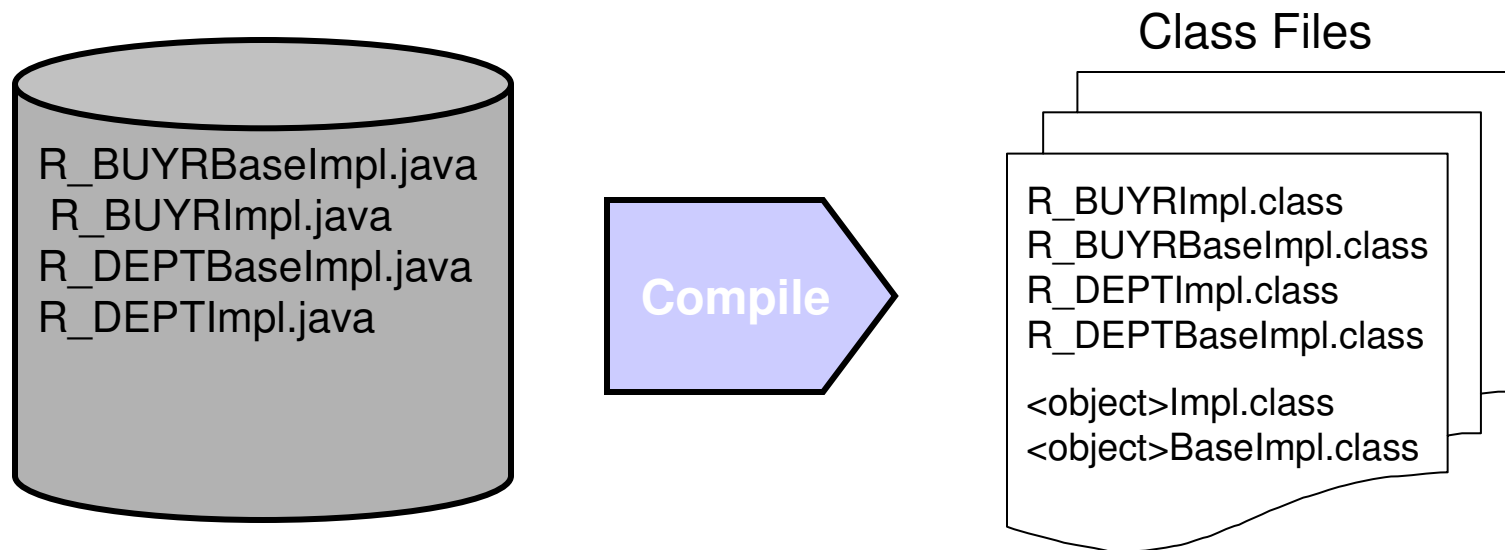
BaseImpl

\\AMSADV3\dev\advantage\Cache\VLS\DataObjects\Financial\<application>

Impl

\\AMSADV3\dev\advantage\Source\VLS\DataObjects\Financial\<Application>

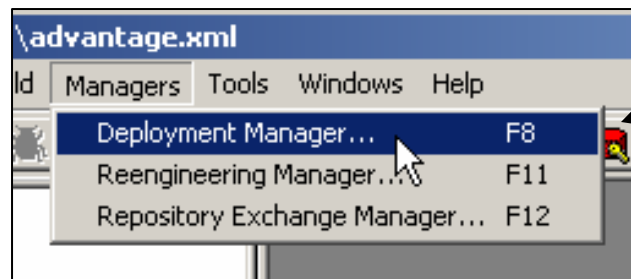
Compiling the Data/Query Object



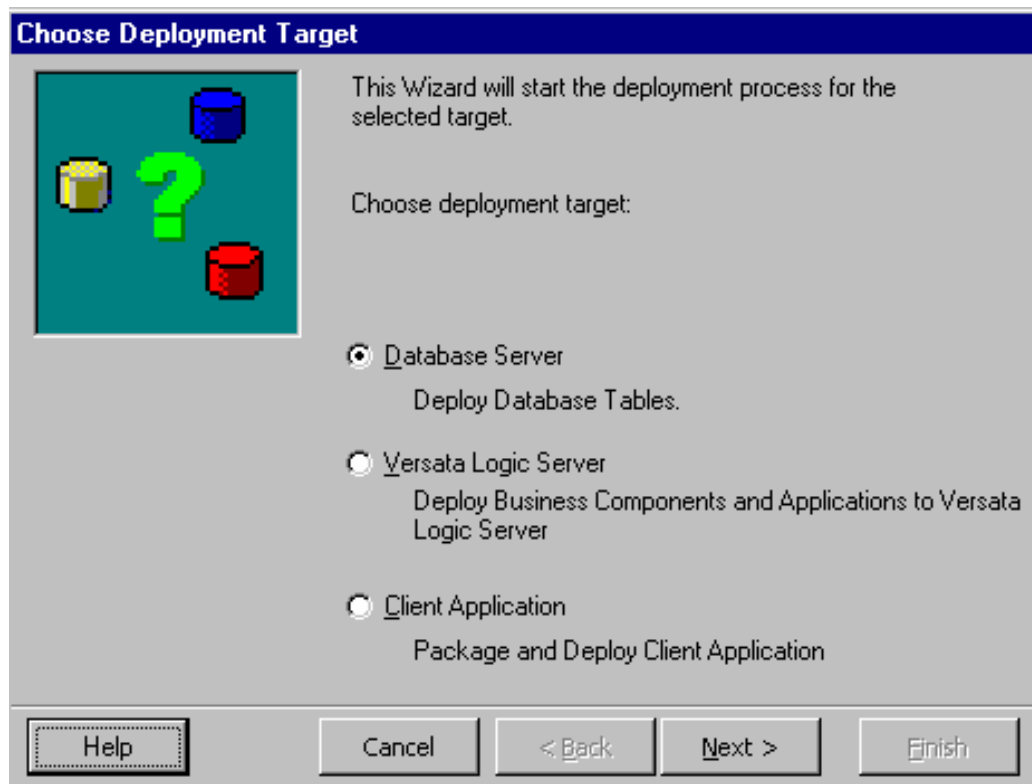
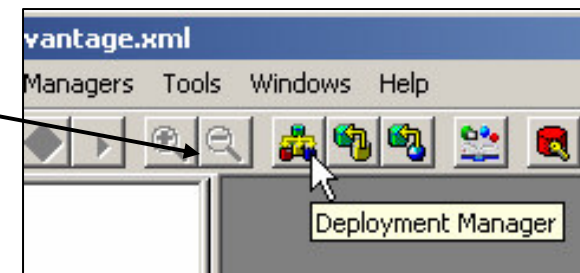
Class files are stored in:

\\AMSADV3\dev\advantage\Lib\VLS\advantage

Deployment Manager



Open the
Deployment
Manager – one
of two ways



Deployment manager
has options for
Database, VLS and
Application
deployment.

Deployment Review – 3 Types

3 Types of Deployment

- **Database Deployment**
 - New Data Objects (tables)
 - Changes to physical layout of existing Data Objects (e.g. adding 'persistent' fields, changing field lengths, field types.
 - Generates SQL Scripts
- **VLS Deployment**
 - New Data Objects or Query Objects
 - Changes to existing Data Objects or Query Objects
- **Client Deployment**
 - New pages
 - Changes to existing pages.

Deployment - VLS

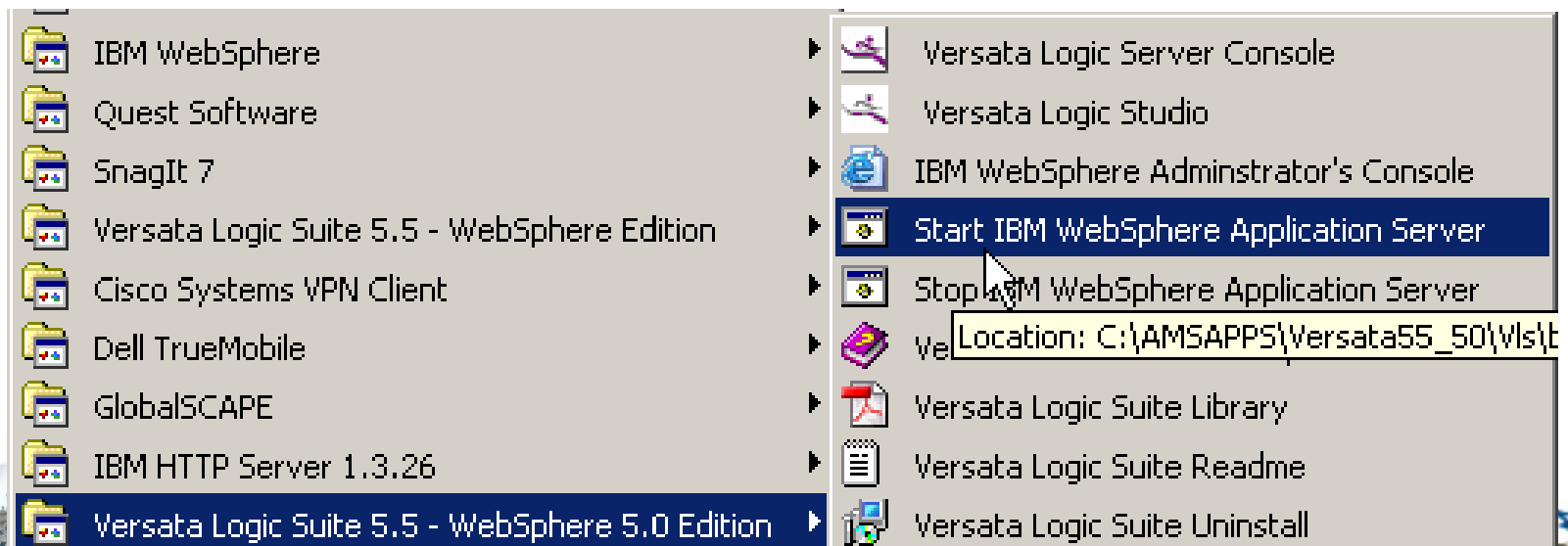
What is a VLS deploy doing?

- Copying class files **from**
C:\AMSADV3\dev\advantage\Lib\VLS\advantage **to**
C:\AMSAPPS\Versata\VlsComponents\Classes\advantage.ear\advantage.jar\advantage
- Registers New DO & QO in VLS Console
 - Newly registered objects require 2 actions:
 - 1. Assign object to main Data Server
 - 2. Grant permissions to object

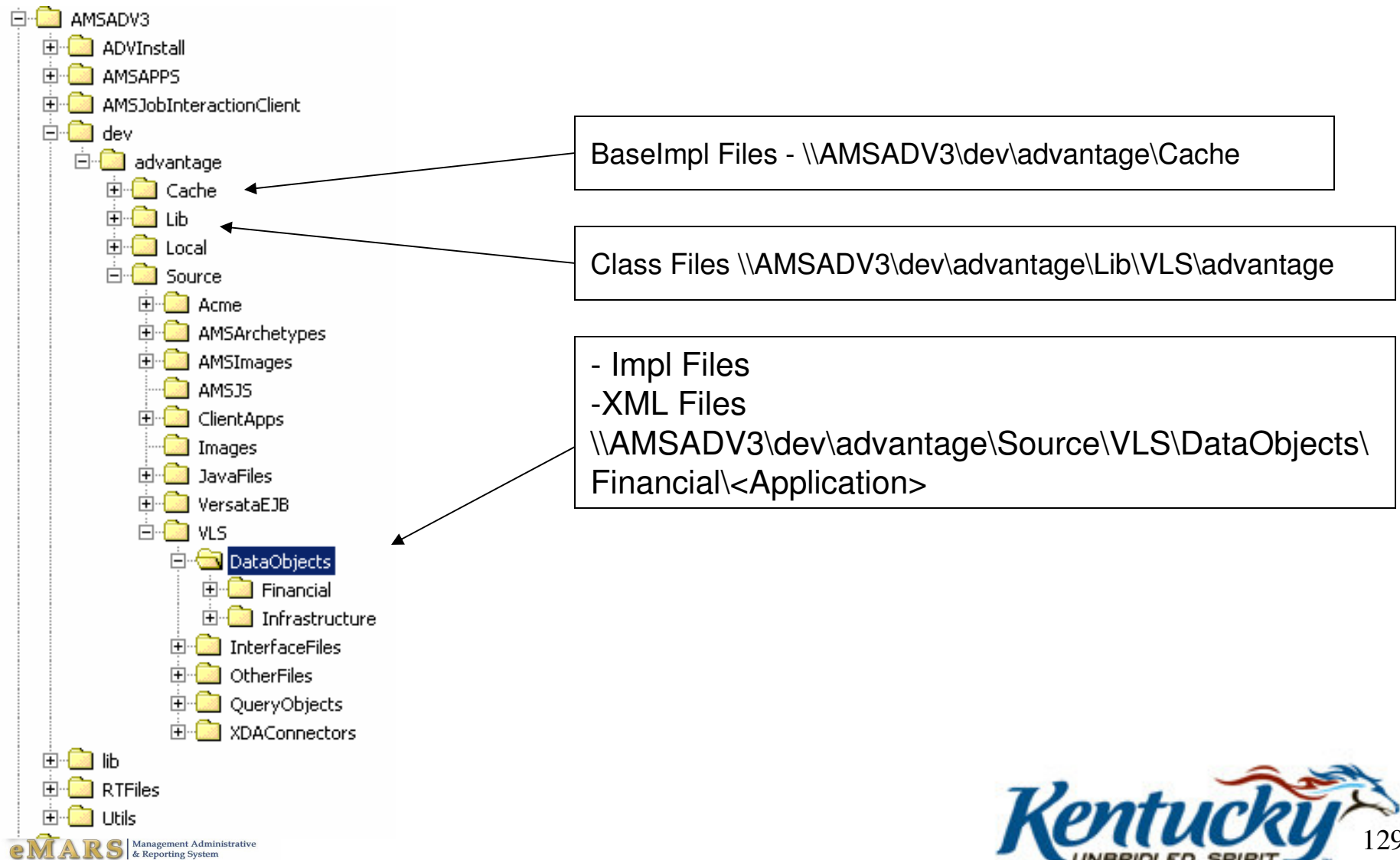
Deployment

If you get the error below – it means you haven't started your App Server.

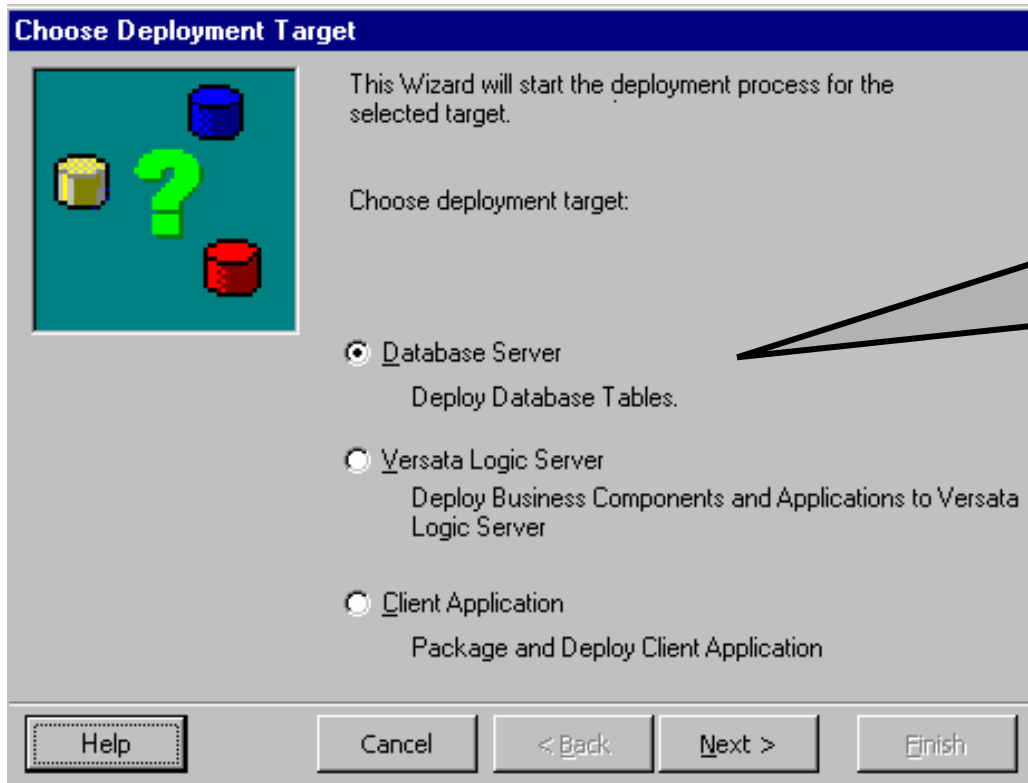
***** Make sure you start it from the Versata folder**



Directory Structure Recap



Deploying to the Database

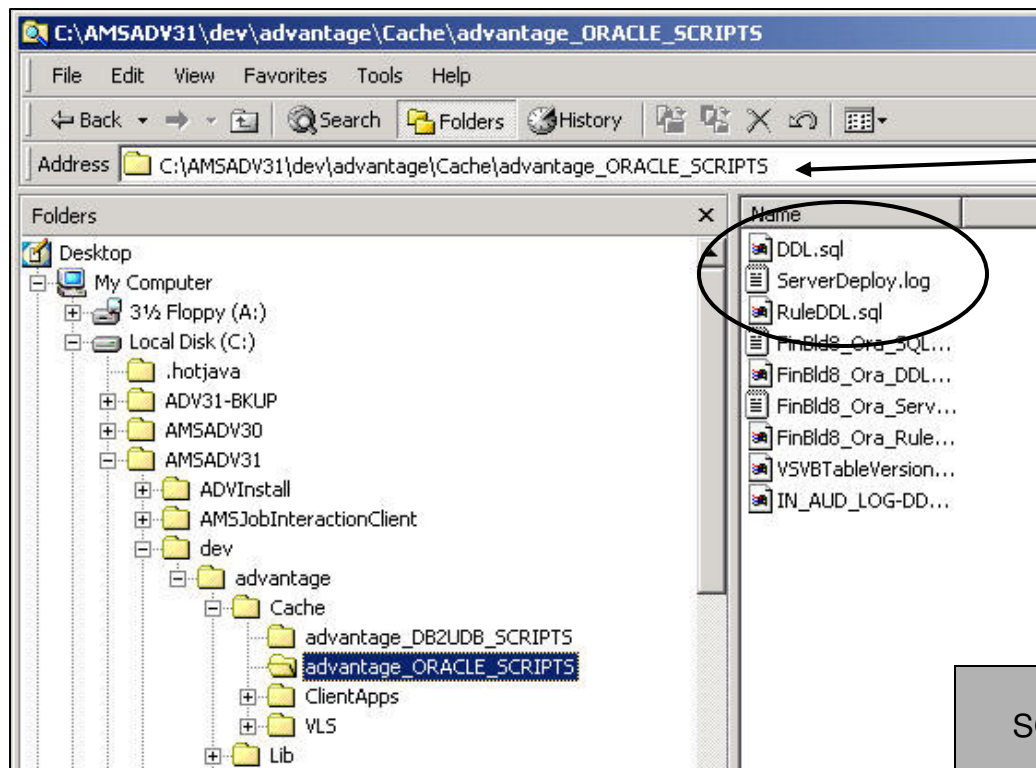


This process will generate SQL that will be loaded to database (Oracle/DB2 etc.) to create or modify tables

When? Database deployment needs to be done when a change to a data object affects the physical layout of the table

- New data object
- New attribute
- Deleted attribute
- Changed data type of attribute
- Change the requirement of an attribute

Deploying to the Database (continued)



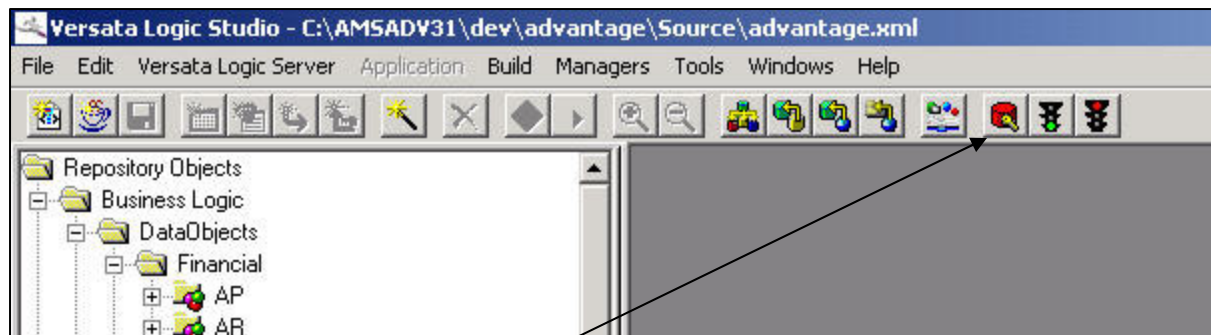
In the advantage_ORACLE_SCRIPTS directory, you should find the DDL.sql and RuleDDL.sql files. These contain sql commands that need to be executed on the database.

SQL commands can be executed against the database using:

- SQLPlus
- Dbsurfer
- Another database tool

VLS Console

After a VLS and Database Deploy of a *new* Data Object, it is necessary to do some configuration in the VLS Console.



VLS Console icon in the Versata Studio

Note: Websphere must be running to open Console.

Login Screen, press OK.

Assign Privileges to New Objects

Versata Logic Server Console

Public

Privileges | Users | Properties

Applications | **Business Objects** | System Privileges

(All)

☐ Data Objects ☐ Query Objects ☒ Both

Object Name	Read	Create	Update	Delete
advantage.ABS_DOC_ACTG	✓	✓	✓	✓
advantage.ABS_DOC_HDR	✓	✓	✓	✓
advantage.ABS_DOC_VEND	✓	✓	✓	✓
advantage.AD_CR_MMO_REC_SEL	✓	✓	✓	✓
advantage.AD_DOC_ACTG				
advantage.AD_DOC_HDR	✓	✓	✓	✓
advantage.AD_DOC_VEND	✓	✓	✓	✓
advantage.AD_PYMT_SLCT	✓	✓	✓	✓
advantage.AGCY_PER	✓	✓	✓	✓

Grant Read
Grant Create
Grant Update
Grant Delete
Grant All
Remove All

Properties | Methods | Attributes

Once a new Object is registered with the VLS, access rights must now be assigned.

Click "Grant All" for Read, Create, Update and Delete. Or select new object from the list and check rights manually.

Privileges can be assigned under Administration\Roles\Public

Business Objects Tab

eMARS Management Administrative & Reporting System

UNBRIDLED SPIRIT

Stop and Start Websphere



In order for the changes to take place, the server must be restarted. Click the green light in the Versata toolbar.

```
C:\WINNT\System32\cmd.exe
C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar;C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\i18n.jar;C:\AMSAPPS\WEBSPH~1\APPSER~1\java\lib\tools.jar" -Dws.def.olt.host=localhost -Dws.def.olt.port=2102 -Dws.def.jdwp.port=7777 -Dws.ext.dirs="C:\AMSAPPS\WebSphere\AppServer\java\lib;C:\AMSAPPS\WebSphere\AppServer\classes;C:\AMSAPPS\WebSphere\AppServer\lib;C:\AMSAPPS\WebSphere\AppServer\lib\ext;C:\AMSAPPS\WebSphere\AppServer\web\help;C:\oracle\ora81\jdbc\lib\classes12.zip;C:\oracle\ora81\jdbc\lib\ncs_charset12.zip" "-Dcom.ibm.CORBA.ConfigURL=file:/C:/AMSAPPS/WebSphere/AppServer/properties/sas.server.props" com.ibm.ws.bootstrap.WSLauncher com.ibm.websphere.install.commands.ProcessLauncherTest -configFile "C:\AMSAPPS\VersataD\config\versata-cfg.xml"

WebSphere Application Server, Advanced Single Server Edition V4.0
Application Server Launcher
Copyright (C) IBM Corporation, 2001

The configuration file was accepted as:
  C:\AMSAPPS\VersataD\config\versata-cfg.xml
Using the single available node or the localhost node.
Using the single available server.
Initiating server launch.
Loaded domain "WebSphere Administrative Domain".
Selected node "npowers-24557".
Selected server "VERSATA".
WSPL0065I: Initiated server launch with process id 1952.
```

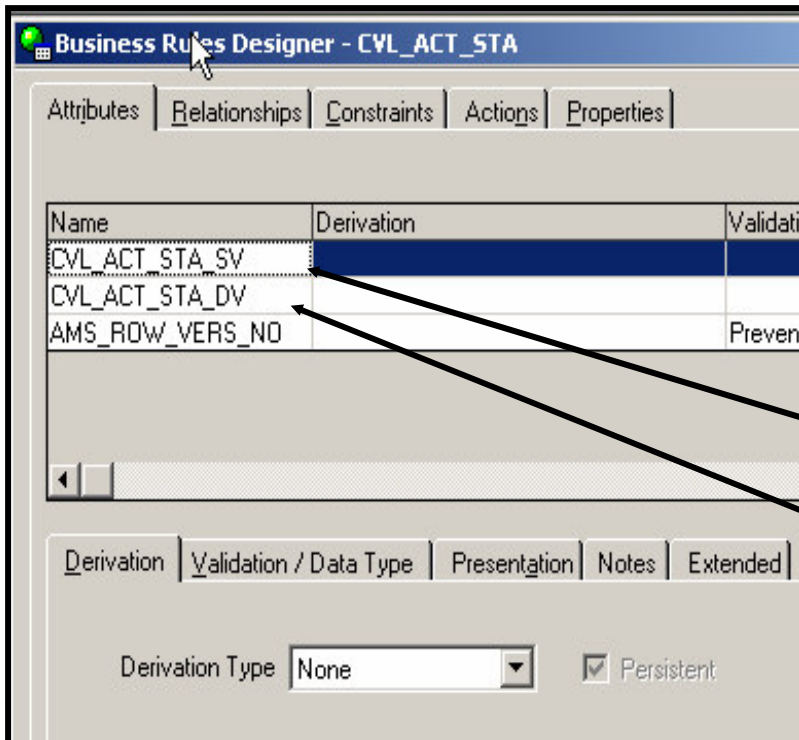
Standardized Data Objects

AMS ADVANTAGE® 3
Application Development



Coded Values List (CVL) Data Object

A table that list a 'stored value' and a 'displayed value' for an attribute, usually the list is static, such as a Vendor's Active Status.



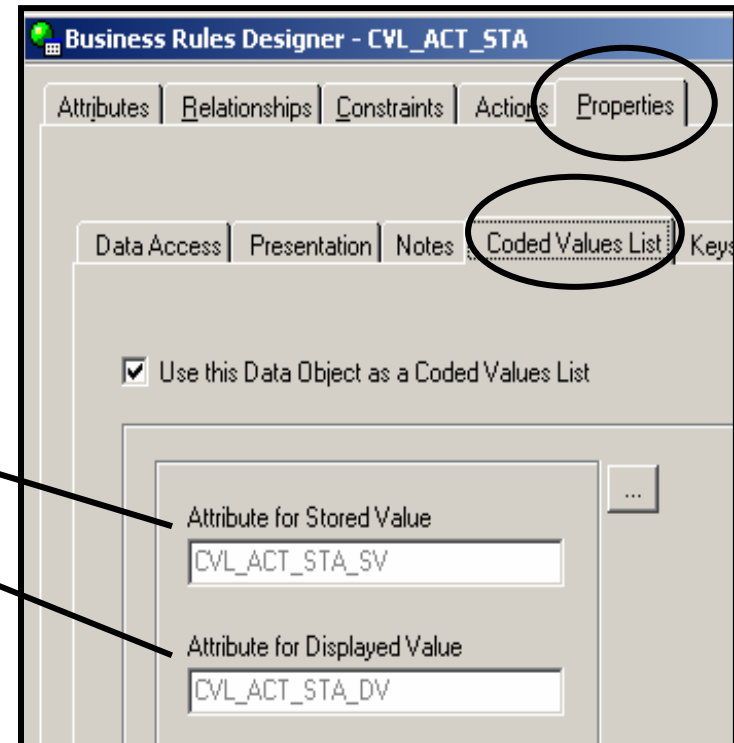
Business Rules Designer - CVL_ACT_STA

Attributes Relationships Constraints Actions Properties

Name	Derivation	Validation
CVL_ACT_STA_SV		
CVL_ACT_STA_DV		
AMS_ROW_VERS_NO		Prevent

Derivation Validation / Data Type Presentation Notes Extended

Derivation Type: None ☒ Persistent



Business Rules Designer - CVL_ACT_STA

Attributes Relationships Constraints Actions Properties

Data Access Presentation Notes Coded Values List Keys

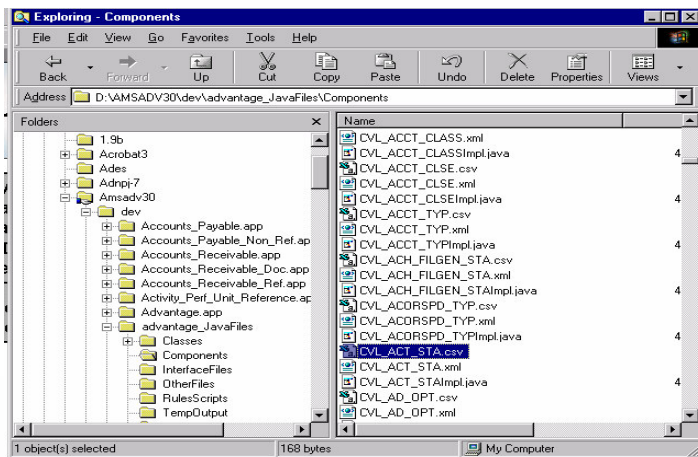
☒ Use this Data Object as a Coded Values List

Attribute for Stored Value: CVL_ACT_STA_SV

Attribute for Displayed Value: CVL_ACT_STA_DV

Using a Coded Values List (CVL)

- Assign a CVL to a field on another data object so that field will be validated against the CVL's values
- Data for the CVL can be entered here in the BRD
- This data will be stored as a CSV (comma separated values) file for the CVL data object



Business Rules Designer - R_VEND_CUST

Attributes | Relationships | Constraints | Actions | Properties

Name	Derivation	Validation
VEND_ACT_STA	Default: 1	Coded Values List(CVL_ACT_STA)
VEND_APRV_S	Default: 1	Coded Values List(CVL_APRV_STA)
CUST_ACT_STA	Default: 1	Coded Values List(CVL_ACT_STA)
CUST_APRV_S	Default: 1	Coded Values List(CVL_APRV_STA)
RSTR_USE_FL	Default: false	Required
PRVNT_NEW_S	Default: false	Required

Derivation | Validation / Data Type | Presentation | Notes | Extended

Validation Type

☐ Condition

☒ Coded Values List

Coded Values List

CVL_ACT_STA

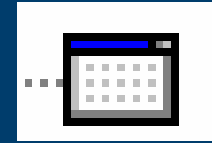
	Stored Value	Display Value
	0	N/A
	1	Inactive
	2	Active
	3	Suspended
	4	Discontinued
	5	Debarred
	6	Delete

Data Type: Number

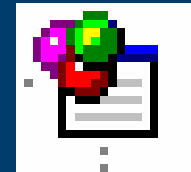
Sub Type: Integer

☐ Value Required

☐ Prevent User Updates



Building HTML Client Applications



AMS ADVANTAGE[®] 3
Application Development

Kentucky
UNBRIDLED SPIRIT[™]

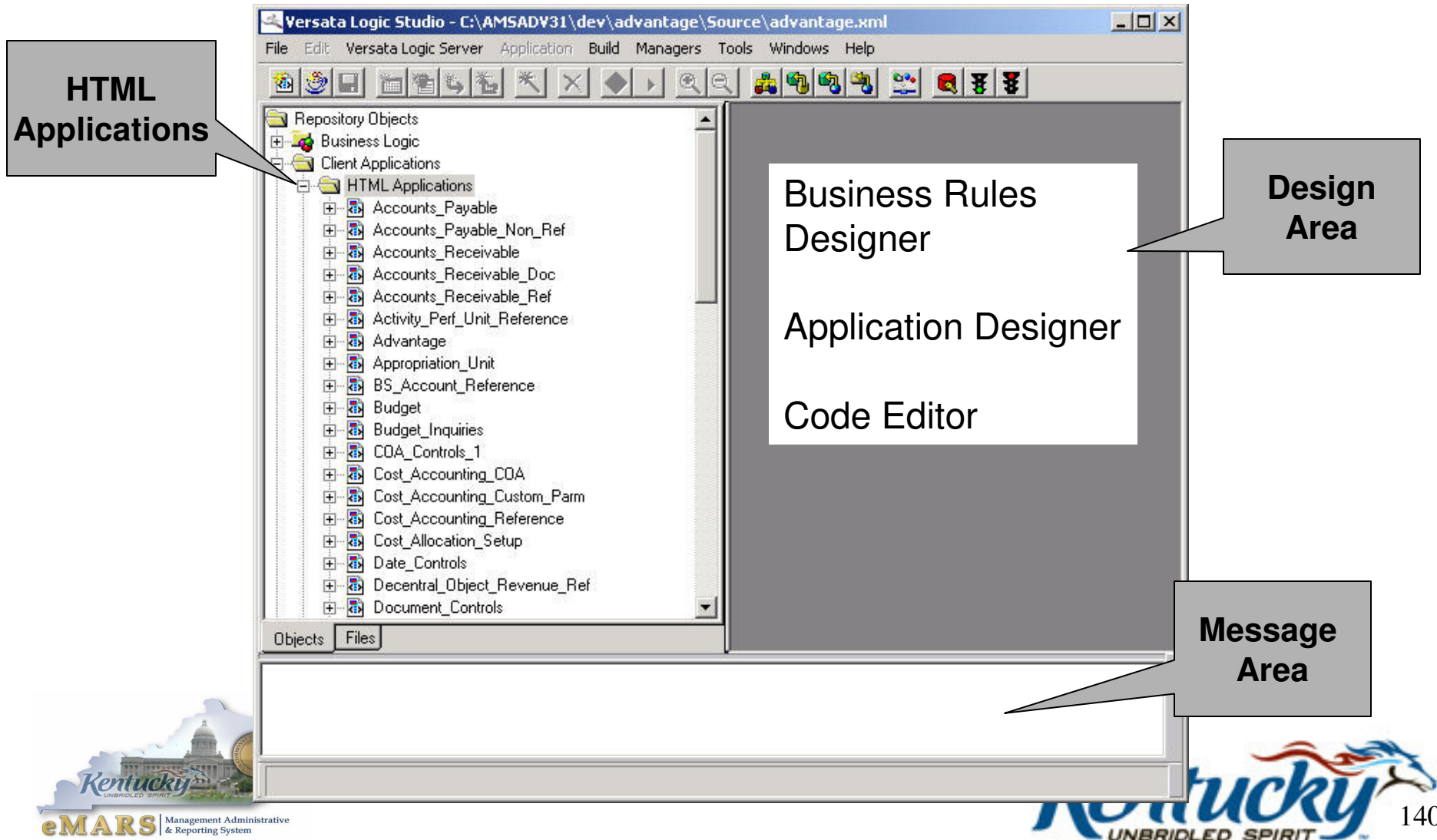
Introduction to HTML Pages

- HTML pages are used to display Business Object data inside the application.
- Business rules are enforced by user actions performed online.

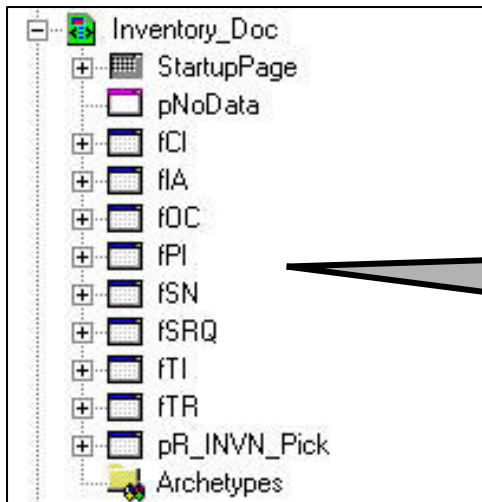
'. The browser status bar at the bottom shows 'Done' and 'Local intranet'."/>

State/Province	State/Province Name
AK	Alaska
AL	Alabama
AR	Arkansas
AZ	Arizona
CA	California

Development Studio

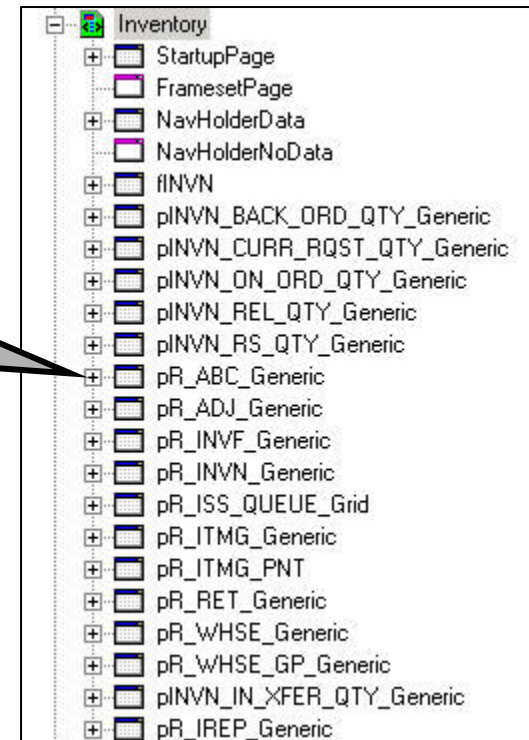


Naming Conventions – Application Objects



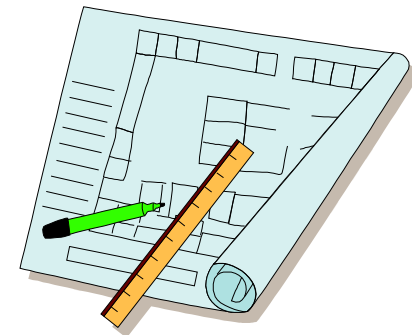
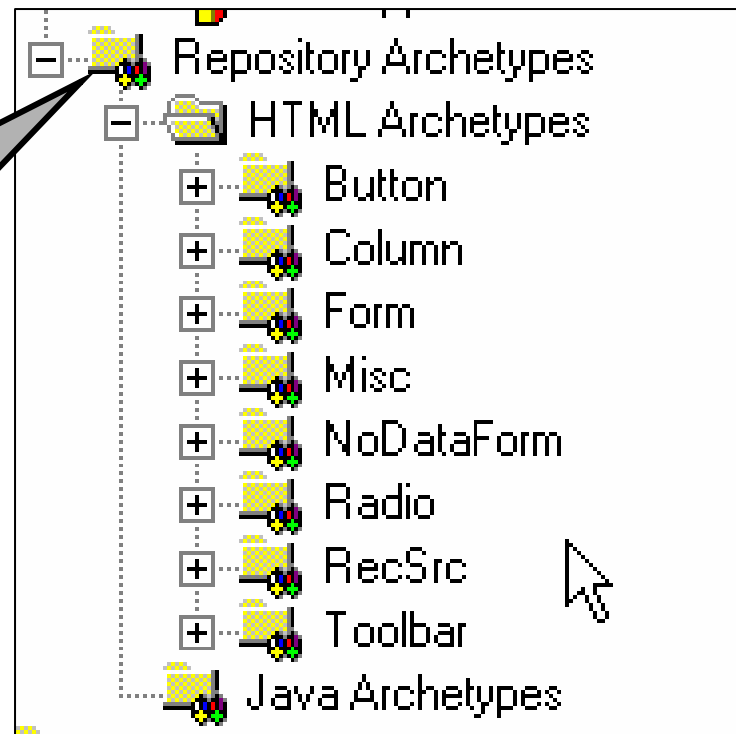
Reference Tables:
p<Object Name>_Generic

Documents:
f<Doc Name>



Archetypes

Archetypes:
Templates
used in
generation of
HTML



Most commonly used
archetypes:

- Pages (Forms)
- Record Sources
- Columns (Attributes)

Archetypes are provided by Infrastructure

Common Page Archetypes

AMSGenericGridDisplay

AMS ADVANTAGE Personalize

Welcome, System Admin Security Administration Application Administration Approval Administration New Workspace New Workspace

ADV31 Bld7-ST05A

▶ **Message Center**

▼ **Search**

Page Search

Document Catalog

Report Search

▶ **History**

▶ **Favorites**

▶ **Administration**

ABC Classification Parameter Quick Search

Department	Unit	ABC Classification	Description
060	ALL	ABC1	Manual Order up to
ALL	ALL	ABC1	Manual Order up to
ALL	ALL	ABC2	test SN
ALL	ALL	ABC3	Low Cost Seasonal EOQ

First Prev Next Last

[Save](#) [Undo](#) [Delete](#) [Insert](#) [Copy](#) [Paste](#) [Search](#)

Department: Forecast Method:

Unit: Order Quantity Method:

ABC Classification: Safety Stock Factor:

Description: Number of Months:

Lead Time Adjustment:

EOQ Order Cost:

EOQ Percentage:

Common Page Archetypes

AMSGenericGridDisplayTabs

AMS ADVANTAGE

Welcome, System Admin Security Administration Application Administration Approval Administration [New Homepage](#) [New Homepage](#)



ADV31 Bid7-ST05A

- ▶ Message Center
- ▼ Search
 - Page Search
 - Document Catalog
 - Report Search
- ▶ History
- ▶ Favorites
- ▶ Administration

Inventory Maintenance [Quick Search](#)

Warehouse	Stock Item	Description	Unit Price	Available	Primary Bin
BIN_WHSE	SER01	Backorder SHKDN	1.500000	0.00000	BIN_1
DED	07008	Bookmobile	8000.000000	0.00000	1
DED	0700801	Bookmobiles - Engine & Parts	25.000000	100.00000	1
DED	07030	School Bus Chassis	25.000000	100.00000	1
DED	99818 01	9th Grade Biology	25.000000	782.00000	1

First Prev [Next](#) [Last](#)

[Save](#) [Undo](#) [Delete](#) [Insert](#) [Copy](#) [Paste](#) [Search](#)  

▶ General Information

▼ Pricing

Pricing Method: Maximum Surcharge:

Unit Price: Standard Price:

Percent Surcharge: Maximum Issue:

Fixed Surcharge: Minimum Issue:

▶ Inferred COA Elements

▶ Location

▶ Reorder Information

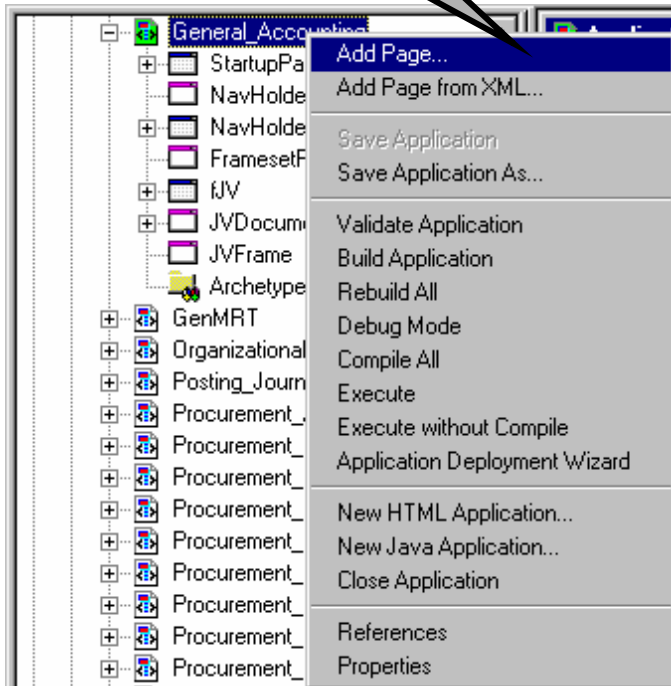
Creating a New Page

AMS ADVANTAGE® 3
Application Development



Creating a Page: Studio Wizard

Right click, then
"Add Page"



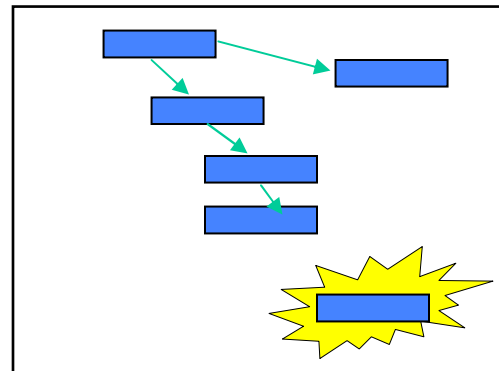
New Page Wizard



1. Select the main data source and page type
2. Select the display style (archetype)
3. Select the page style (archetype)



Application Designer



New page appears
in Application Designer

Creating a Page: Studio Wizard

- Three main steps:
 - selecting the main data source and page type
 - selecting the display style archetype
 - selecting the page style archetype and choosing the page's name.

Choose Your Record Source

Choose Main Source of Data for New Page

Versata pages are normally data-driven pages where the displayed data comes from automatically built queries based on the chosen RecordSource. An empty page has not specified a main RecordSource. The developer manages all controls and data on these pages. An external page comes from another application and is not validated.

☒ Data-driven page ☐ Empty page ☐ External page

☒ Show All
☐ Show Groups

☒ Calculate Master/Detail
☒ Grids and Transitions Options

Data Objects | **Query Objects**

- A2SYNC_LOG
- ABS_DOC_ACTG
- ABS_DOC_HDR
- ABS_DOC_VEND
- AD_DOC_ACTG
- AD_DOC_HDR

Help Cancel < Back Next > Finish

Select Record Source
for page
*This should be your
Data Object or Query
Object*

Record Source Archetype

Choose Display Style for R_BUYR Data

Select an archetype for displaying R_BUYR:

Archetype	Description
AMSDocTabGridDisplayTabs	Used to create a tabbed record source for an editable line
AMSDocTabGridEditable	Descriptive text is not available
AMSGenericGridDisplay	Used to create a generic record source consisting of a grid
AMSGenericGridDisplayTabs	Generic record source with tabbed, editable scalar fields
AMSGridEditable	multiple rows displayed in a single fashion. Editable display

Specify Attributes

Help Cancel < Back Next > Finish

‘Display Style’ is your ‘Record Source Archetype’. Most pages will use AMSGenericGridDisplay or AMSGenericGridDisplayTabs. Tabs allow pages to group like fields for easier use.

Page Level Archetype

Choose Page Style

Choose a page style.

You may also change the default name and caption for the new page.

Archetype	Description
AMSRefTableGridDis	A simple grid/scalar reference table layout.
Default	default page with independent transitions at top of page with the
DialogStyle	dialog style page useful for updateable recordsources. OK at

Page Name:


Page Caption:

Help Cancel < Back Next > Finish

‘Page Style’ is your ‘Page Level Archetype’. Most pages will use AMSRefTableGridDisplay

Creating Pick Objects

Choose Additional Options



Some additional operations may be performed at this time. You may choose to do some or all of these steps.

Master/Detail creation will allow grid creation on pages where possible candidates exist.

Transition creation allows selection of probable transition candidates.

Parent pick creation allows selection of possible parent foreign keys.

☐ Create Master/Detail Pages

☐ Create Transitions

☒ Create Parent Picks

Set Defaults...

Help Cancel < Back Next >

Check the 'Create Parent Picks' option. This will give you the next choice to select which fields will have Pick Objects. Based off existing Parent Relationships.

Select from the list of possible parent picks:

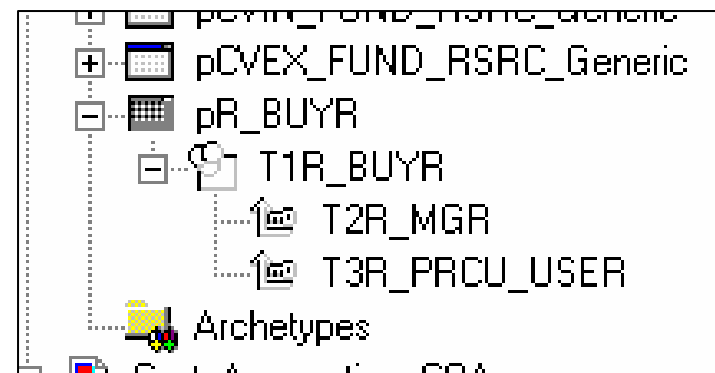
- ☒ R_MGR
- ☒ R_PRCU_USER

Select All Select None

Finishing Up



It is not necessary to create a Transition to the StartUp page. After you click 'No', your page object in the repository will be created. Go find it in the Explorer Area of the Studio.



Break

AMS ADVANTAGE® 3
Application Development



Modifying a Page

AMS ADVANTAGE® 3
Application Development



ADVANTAGE Page Layout

Inventory Maintenance Quick Search

Page Title

Sortable Field

Warehouse	Stock Item	Description	Unit Price	Available	Primary Bin
DED	07008	Bookmobile	8000.000000	100.00000	1
DED	0700801	Bookmobiles - Engine & Parts	25.000000	90.00000	1
DED	07030	School Bus Chassis	25.000000	90.00000	1
DED	99818 01	9th Grade Biology	25.000000	25.50000	1
DED	99818 02	9th Grade Math	25.000000	90.00000	1

Page Actions

First Prev Next Last

Save Undo Delete Insert Copy Paste Search

Expand/Collapse All

Grid

Search Window

Tab 1

General Information

Warehouse: DED
This warehouse stores schools supplies

Stock Item: 07030

Stock Item Suffix:

Description: School Bus Chassis

Suggested Vendor: AMS-01
SL&S

Quantity per Issue: 1.00000

ABC Class: ABC1
Default ABC Classification.

Stock Group:

Parent Item: ☐

Frozen for Accounting: ☐

Costing Method: Average Costing

Unit Cost: 25.000000

Extended Cost: \$2,250.00

Issue Unit: EA

Purchase Unit: EA

Multiplier: 1

Smaller Unit: Issue Unit

Keyword Search: Issue Unit
Purchase Unit

Extended Description:

CVL

Scalar

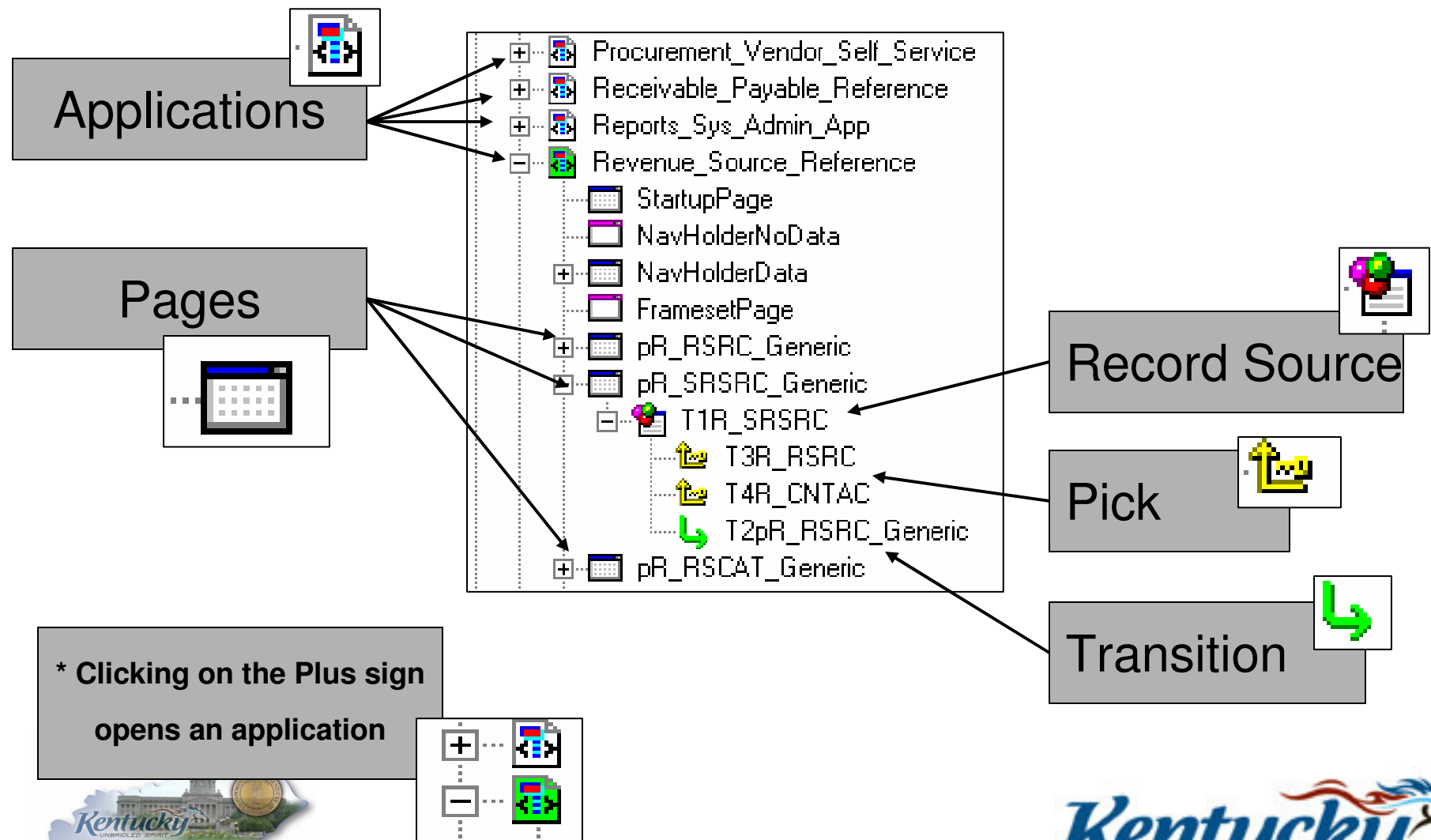
Pick List

Note the different attribute archetypes.

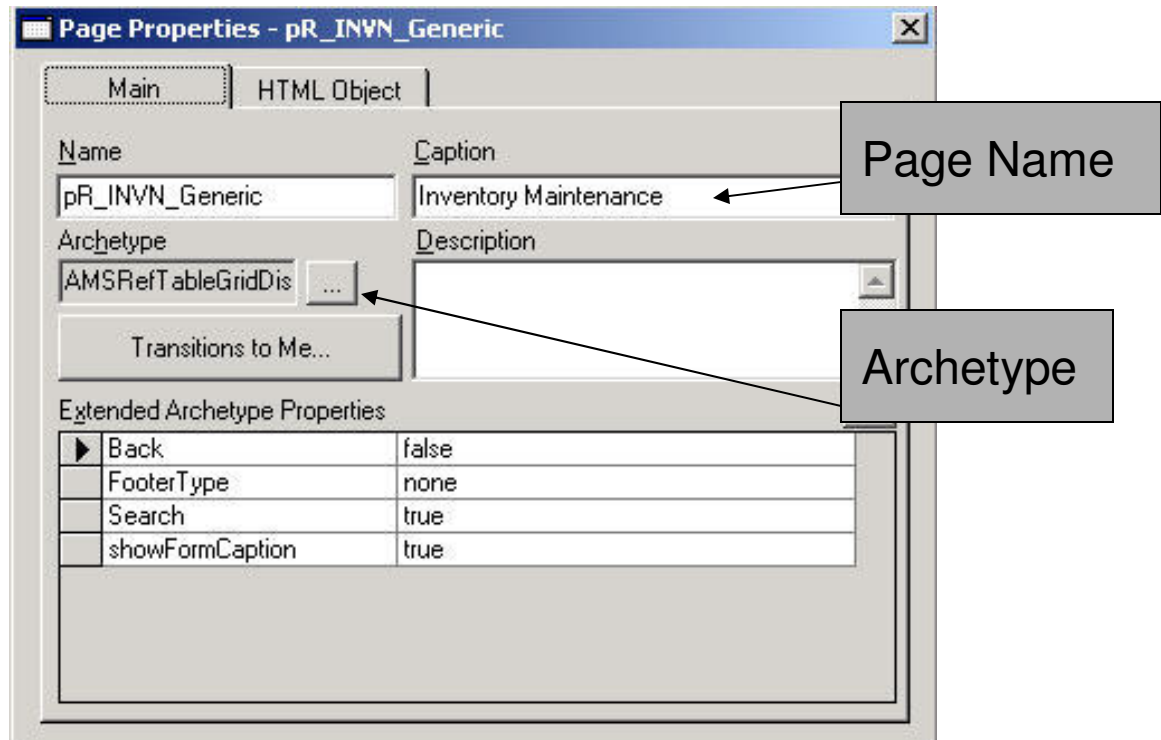
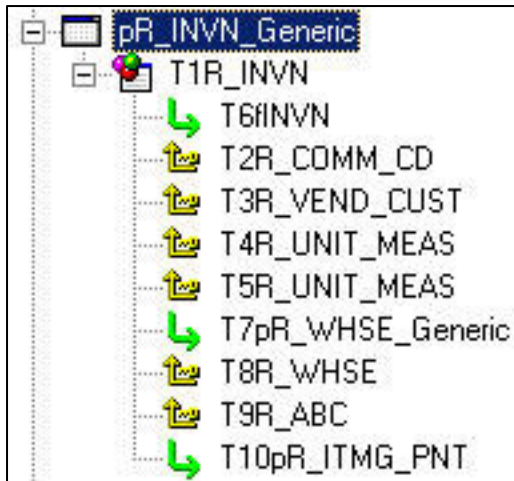
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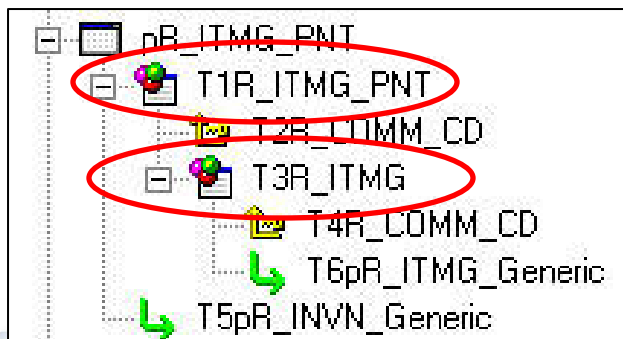
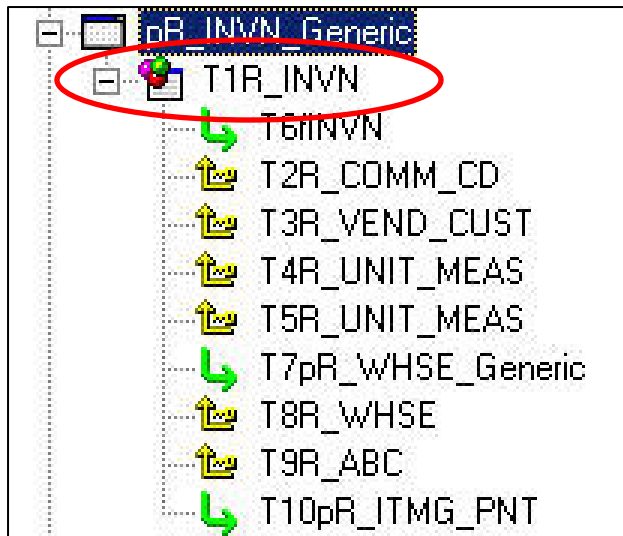
Client Application Objects



Page Properties



Record Sources



Record Sources give pages the ability to display object attributes.

Most reference tables contain only one record source, but can contain more.

Record Source Properties - Main



RecordSource Properties - T1R_INVN

Main | Query | Attributes | HTML Object

Data/Query Object Name: R_INVN
Prefix for Elements: T1

RecordSource Archetype: AMSGenericGridDisplay

Extended Archetype Properties

DetailsCaption	
DownloadFileType	none
New_Column_Fields	%COST_METH%%MAX_SRCHRG%%INVN_ACCT_C



Extended Archetype Properties

DetailsCaption	
DownloadFileType	none
New_Column_Fields	%COST_METH%%MAX_SRCHRG%%INVN_ACCT_C
ObjectAttachments	false
showCopyPaste	true
showSearchWin	true
SummaryCaption	
Tab_10_Delimiter	
Tab_10_Name	
Tab_1_Delimiter	%WSE_CD%
Tab_1_Name	General Information
Tab_2_Delimiter	%PRICE_METH%
Tab_2_Name	Pricing
Tab_3_Delimiter	%INVN_OBJ_CD%
Tab_3_Name	Inferred COA Elements

Format: %Field1%%Field2%

Format: %Field Name%

Property: DetailsCaption

Value:

Valid Values:

Close

Extended Archetype Properties

nce

Item	Description	Unit Price	Available	Primary Bin
	Bookmobile	8000.000000	100.00000	1
	Bookmobiles - Engine & Parts	25.000000	90.00000	1
DED 07030	School Bus Chassis	25.000000	90.00000	1
DED 99818 01	9th Grade Biology	25.000000	25.50000	1
DED 99818 02	9th Grade Math	25.000000	90.00000	1

First Prev Next Last

Save Undo Delete Insert Copy Paste Search

General Information

Pricing

Pricing Method: Standard Price with No Surcharge Maximum Surcharge: 0.000000

Unit Price: 8000.000000 Standard Price: 8000.000000

Percent Surcharge: 0.00 Maximum Issue: 99999.99999

Fixed Surcharge: 0.000000 Minimum Issue: 0.000000

Inferred COA Elements

Location

Reorder Information

New Column Fields

Tab n Delimiter

Record Source Properties - Attributes



The Record Source Properties determine which attributes will be displayed on the page, both the scalar and grid.

Attributes can be moved up or down to change display order.

Select an attribute and select Displayed, or Not Displayed

RecordSource Properties - T1R_INVN

Main | Query | Attributes | HTML Object

Scalars | Grid

Reset to Defaults

Displayed on Page

Not Displayed on Page

Display All Required

Archetype ☒ Use System Default

PickChoice

Transition Object to Use

n/a

** Not displayed.

Choose Archetype

Archetypes

OptionButton

OptionButtonReq

Password

PasswordReq

PickAccept

PickChoice

PickChoiceReq

QueryCombobox

Description

a data bound control to perform a parent lookup via a second page.

Archetypes: Repository

OK

Cancel


Attribute Archetype

Common Attribute Archetypes

PickChoice
DisplayOnlyTextNoLabel

Warehouse : 
This warehouse stores schools supplies

ComboBox
DisplayOnlyText2

Costing Method : 
Unit Cost : 0.000000

CheckBox

Parent Item : ☒

AMSDateChoiceCalendar

Effective From : 

TextBoxMemo

Description :

AMSupperCaseTextBox – used for _UP (uppercase) fields which must be on the page to be able to search. This archetype makes field invisible to user, but still allows searching.

Record Source Properties – HTML Object



The dialog box has four tabs: Main, Query, Attributes, and HTML Object. The HTML Object tab is selected. It contains the following fields and controls:

- Class Name:** A dropdown menu showing 'com.amsinc.gems.adv.vfc.html.AMSDataSource' and a 'Register...' button.
- Save Mode:** A dropdown menu showing 'Immediate'.
- Fetches Block Row Count:** A text box containing '16'.
- Max. Grid Row Count:** A text box containing '5'.
- Allow Delete:** A checked checkbox.
- Allow Insert:** A checked checkbox.
- Allow Update:** A checked checkbox.
- Pre-fetch Row Count:** An unchecked checkbox.
- com.amsinc.gems.adv.vfc.html.AMSDataSource Properties:** A list box containing:
 - ColumnProjectionLevel
 - DownloadFileName
 - DownloadMaxRows
 - DownloadProperties
 - DownloadTemplate

Always extend
AMSDataSource

Search Column
List specifies
which fields to
search on.

This window displays the properties for the 'com.amsinc.gems.adv.vfc.html.AMSDataSource' class. It features a list of properties on the left and their corresponding values on the right.

Property	Value
ColumnProjectionLevel	
DownloadFileName	
DownloadMaxRows	
DownloadProperties	
DownloadTemplate	
maintenanceString	
MirrorPageEndWith	
MirrorPageStartWith	
PreFetchRowCount	
SearchColList	"WHSE_CD,WHSE_DSCR_UP,STK_COMM_CD,ST
VirtualResultSet	
ZoomDataSource	

Format: "Field1,Field2,..."

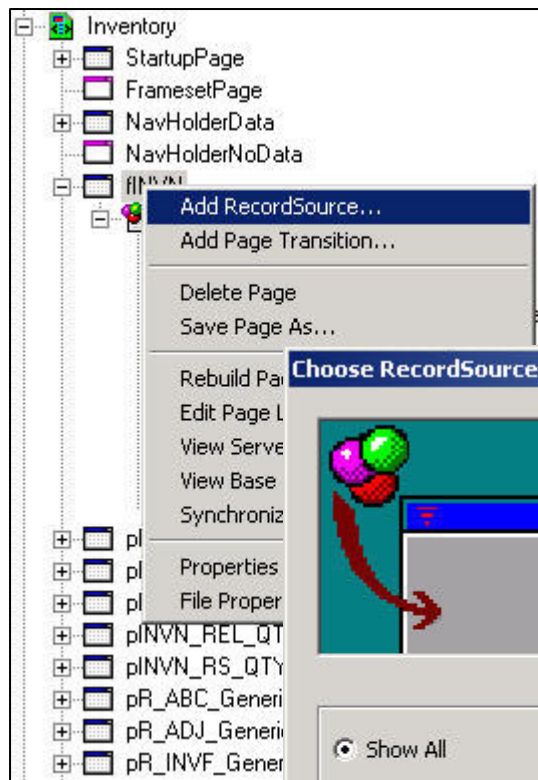
- Allow Delete, Insert, Update fields correspond to those displayed on the page.
- Fetched Block Row Count is the number of records to fetched from the database, default is 16.
- Max Grid row count is the number of rows to display in the grid, default is 5

Edit window

Close

Properties must be properly typed. i.e. String properties must be enclosed in double quotes.

Adding RecordSources to a Page



To add a Record Source, right click on the desired page to start the wizard.

Wizard



Choose RecordSource to Add



Select the data object or query object that you wish to display data for:

Select Object

☒ Show All

☐ Show Groups

☒ Calculate Master/Detail
Grids and Transitions
Options

Data Objects | Query Objects

A2SYNC_LOG
ABS_DOC_ACTG
ABS_DOC_HDR
ABS_DOC_VEND
AD_DOC_ACTG
AD_DOC_HDR

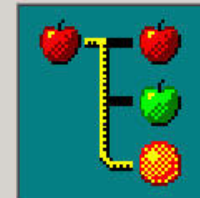
Help

Cancel

< Back

Next >

Choose Data Dependency



The data displayed on this page is dependent on another RecordSource in a master/detail relationship or can be made independent.

How will the new RecordSource be related to the others on this page?

☒ Independent

☐ Dependent

Select Dependent RecordSource

T1R_ABC

Help

Cancel

< Back

Next >

Finish

Independent or
Dependent?

Adding RecordSources to a Page



Choose Display Style for R_RET Data

Select a format for displaying R_RET:

Archetype	Description
AMSDocTabGridEdita	Descriptive text is not available.
AMSGenericGridDispl	Used to create a generic record source consisting of a grid and
AMSGenericGridDispl	Generic record source with grid a tabbed, editable scalar form
AMSGridEditable	multiple rows displayed in a tabul fashion. Editable display of row
AMSGridNonEditable	multiple rows displayed in a tabul fashion. read only display of row

Filter and Sort Records...

Specify Attributes

Help Cancel < Back Next > Finish

Select an Archetype

Wizard



Choose Additional Options

Some additional operations may be performed at this time. You may choose to do some or all of these steps.

Transition creation allows selection of probable transition candidates.

Parent pick creation allows selection of possible parent foreign keys.

☐ Create Transitions

☐ Create Parent Picks

Help Cancel < Back Next > Finish

Create Transition?

Transitions



Inventory Maintenance

[Quick Search](#)

Warehouse	Stock Item	Description	Unit Price	Available	Primary Bin
DED	07008	Bookmobile	8000.000000	100.00000	1
DED	0700801	Bookmobiles - Engine & Parts	25.000000	90.00000	1
DED	07030	School Bus Chassis	25.000000	90.00000	1
DED	99818 01	9th Grade Biology	25.000000	25.50000	1
DED	99818 02	9th Grade Math	25.000000	90.00000	1

[First](#) [Prev](#) [Next](#) [Last](#)

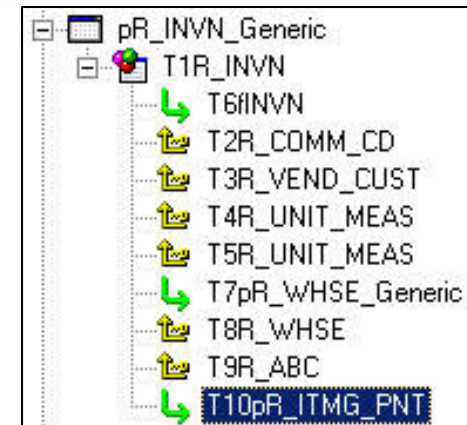
[Save](#) [Undo](#) [Delete](#) [Insert](#) [Copy](#) [Paste](#) [Search](#)

- ▶ [General Information](#)
- ▶ [Pricing](#)
- ▶ [Inferred COA Elements](#)
- ▶ [Location](#)
- ▶ [Reorder Information](#)

[Top](#)

[Inventory Inquiry](#) [Warehouse Maintenance](#) [Item Group](#)

A transition is a
hyperlink to
another page
in the
application



Page Transition Properties - T10pR_ITMG_PNT

Transition | Query | HTML Object

Target Page Name: ... Prefix for Controls:

Caption:

Initial Mode on Transition:

- ☒ Browse
- ☐ Query
- ☐ Add

☒ Show line in Application Diagram

Description:

Name to be
displayed on page

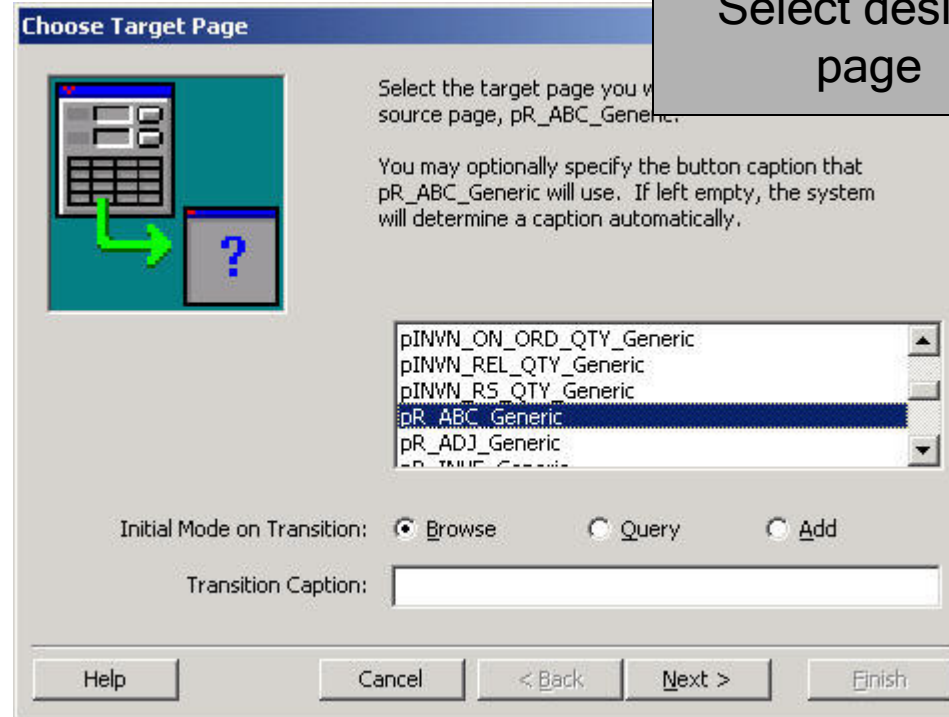
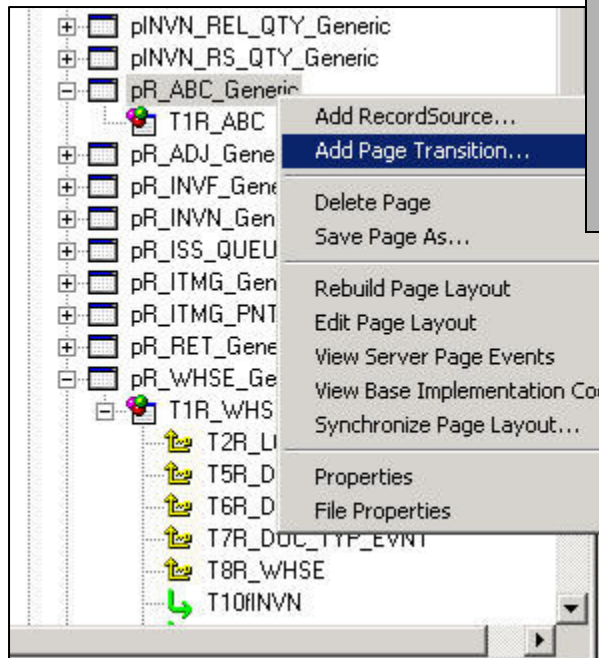
Adding Transitions to a Page



Wizard



To add a Transition, right click on the desired page to start the wizard.



Select desired page

Pick Lists



Issue Unit: 



Pick Lists allow easier data input. Data can be narrowed down to a list of valid entries for users to select.

Choose

[Browse](#) [Clear](#)

Unit of Measure : Description :

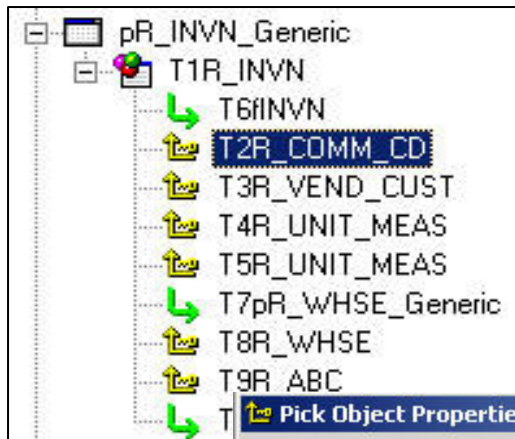
Unit of Weight :

	Unit of Measure	Description	Unit of Weight
Select	BAG	Bag	false
Select	BALE	Bale	false
Select	BALL	Ball	false
Select	BAND	Band	false
Select	BIAN	Bi-Annual	false
Select	BIMO	Bi-Monthly	false
Select	BMWK	Bi-weekly	false
Select	BLCK	Block	false
Select	BNDL	Bundle	false
Select	BOX	Box	false

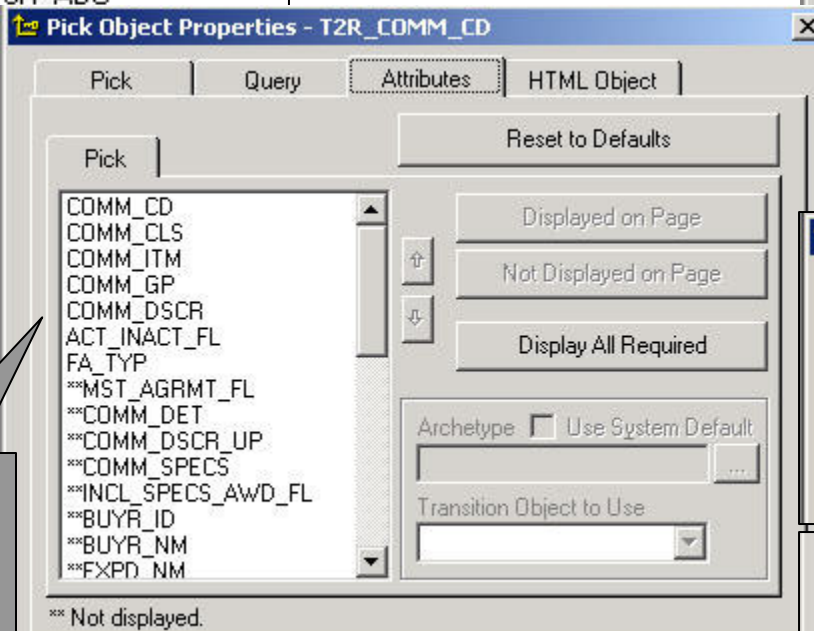
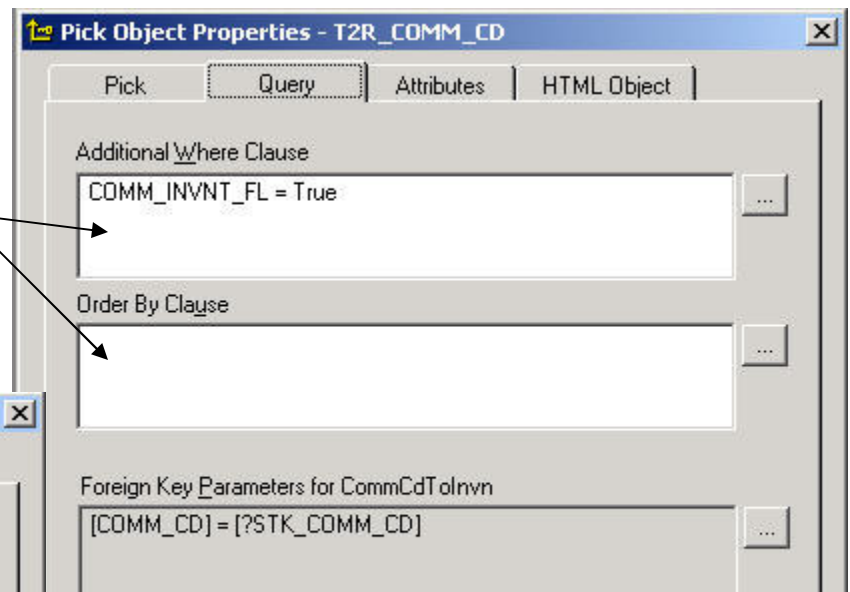
[Cancel](#) [First](#) [Previous](#) [Next](#) [Last](#)

Searchable
Fields

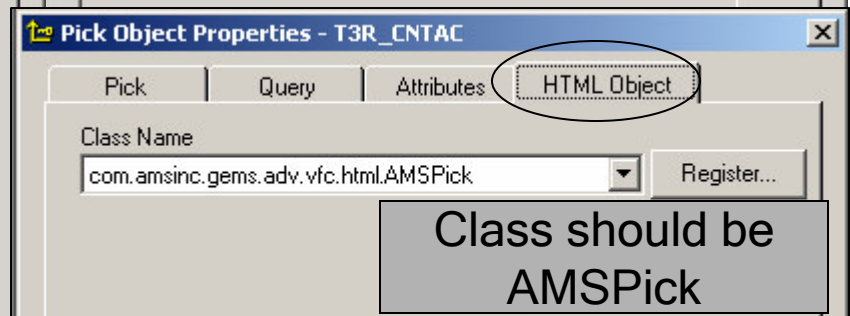
Pick Lists



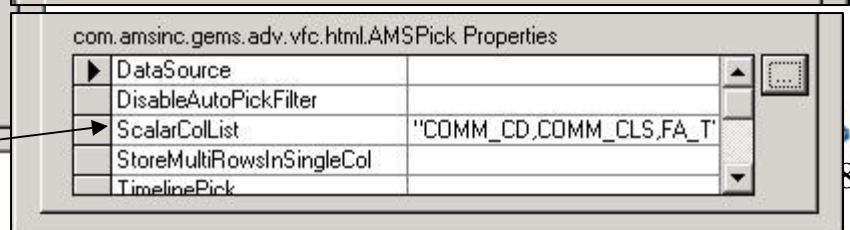
Similar to transitions, Queries and sorts can be specified.



Select attributes to display.



Class should be AMSPick



Searchable Fields

Pick Properties

Opening an Existing Pick's Properties Sheet:

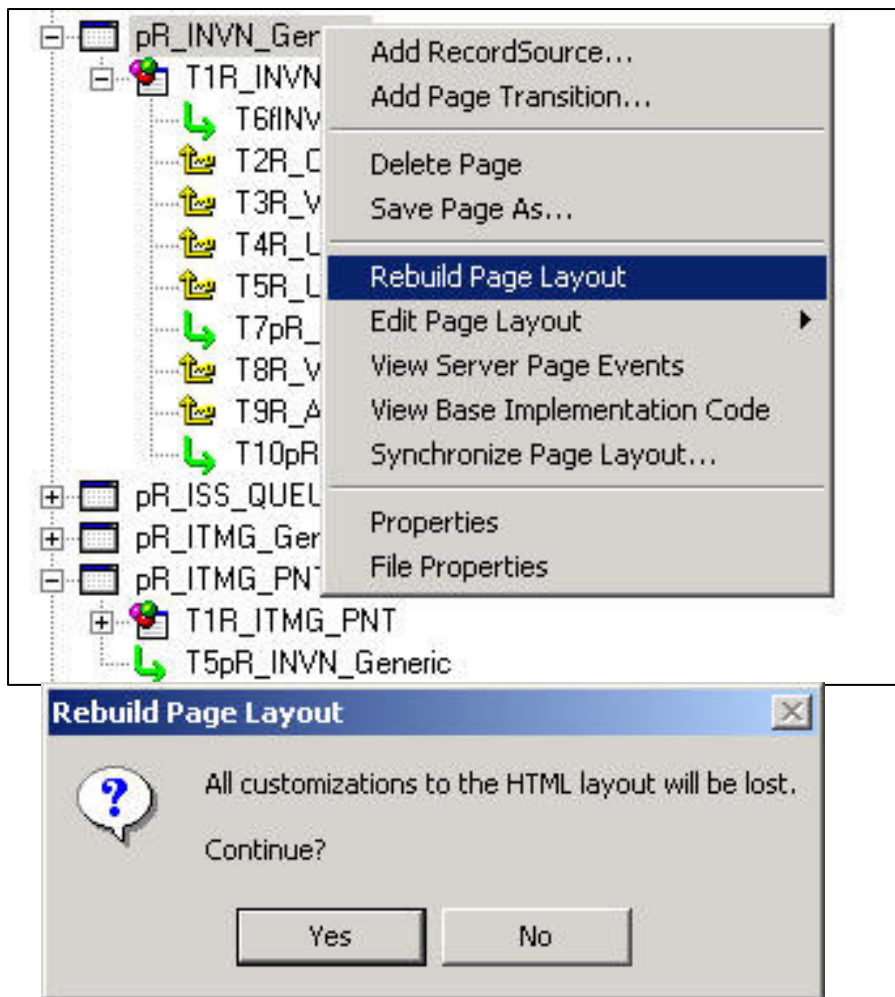
1. Select the component and right-click.
2. Select Properties from the pop-up menu.
3. Make your changes in the Properties sheet.
4. Close the Properties sheet.

Pick Properties

Changes you can make to Picks through the Properties Sheet:

- Data source
- Page for the pick
- Filtering and sorting options
- Attributes to be displayed
- Class name

Rebuilding Pages



Once the page has been defined, it must be rebuilt before being deployed to the VLS.

This will generate the HTML and java files associated with each page. Each time the page is rebuilt, customizations to the HTML will be lost.



No color until the page is rebuilt.

Changing Page Properties

1. Select the page and right-click.
2. Select Properties from the the pop-up menu.
3. Make your changes in the Properties sheet. For example, to rename the page, enter a new name in the Name field.
4. Close the Properties sheet.

NOTE: You can also make your changes directly in the page's XML file.

Deleting a Page

- Select the page and right-click.
- Select Delete Page from pop-up menu. Versata Studio will display a warning pop-up. Click Yes.

Versata HTML Editor

Versata provides a generic HTML editor to make changes after page is rebuilt.

The screenshot displays the Versata HTML Editor interface, titled "Page Designer - pR_INVF_Generic". The main workspace shows a form layout with various input fields and labels. A table is visible with columns: Warehouse, Warehouse Description, Stock Item, Stock Item Description, and Discrepancy. Below the table are navigation links: First, Prev, Next, Last. At the bottom, there are action buttons: Save, Undo, Delete, Insert, Copy, Paste. The right side of the interface features a "ToolB..." toolbar with icons for various editing functions. A context menu is open over the "pR_INVF_Generic" element, showing options such as "Add RecordSource...", "Add Page Transition...", "Delete Page", "Save Page As...", "Rebuild Page Layout", "Edit Page Layout" (which is highlighted and has a sub-menu), "View Server Page Events", "View Base Implementation Code", "Synchronize Page Layout...", "Properties", and "File Properties". The sub-menu for "Edit Page Layout" includes "Versata HTML Editor" and "External HTML Editor".

Page Designer - pR_INVF_Generic

Warehouse : WHSE_CD

Warehouse Description : WHSE_DSCR_UP

Stock Item : STK_COMM_CD

Stock Item Suffix : STK_ITM_S

Stock Item Description : STK_ITM_DSCR_UP

Actual Quantity : ACTU_QTY

Adjustment Code :

Primary Bin :

Bin 1 :

Bin 2 :

Issue Unit :

Discrepancy :

First Prev Next Last

Save Undo Delete Insert Copy Paste

ToolB...

Context Menu:

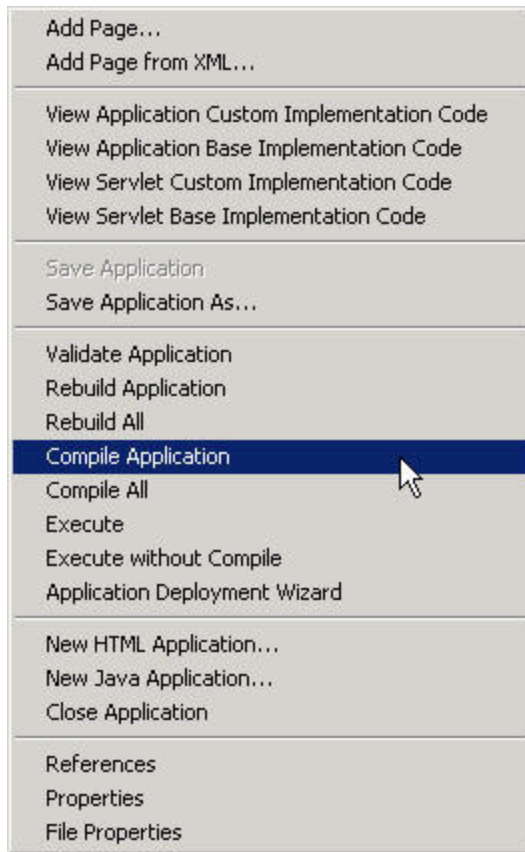
- Add RecordSource...
- Add Page Transition...
- Delete Page
- Save Page As...
- Rebuild Page Layout
- Edit Page Layout
 - Versata HTML Editor
 - External HTML Editor
- View Server Page Events
- View Base Implementation Code
- Synchronize Page Layout...
- Properties
- File Properties

Bottom Bar:

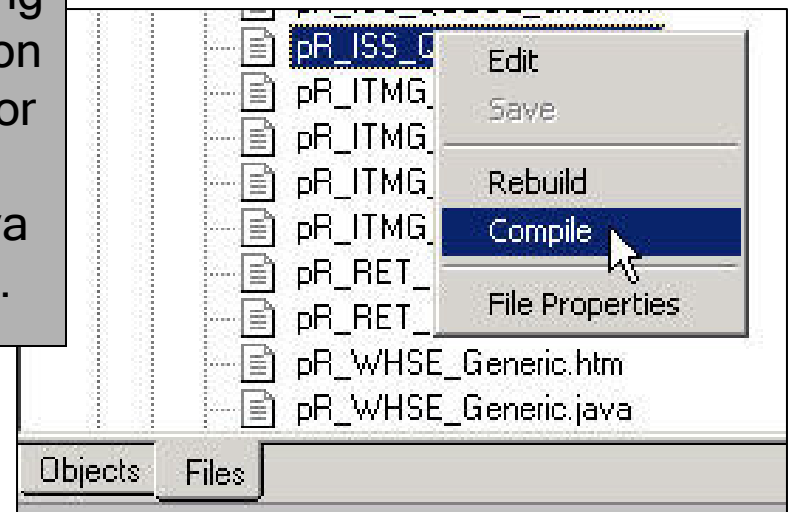
eMARS Management Administrative & Reporting System

Kentucky UNBRIDLED SPIRIT

Compiling Applications



Once the page is developed and custom code added, the java file needs to be compiled to a class file. This can be done by compiling the whole application in the object view, or compiling the individual page java file in the file view.

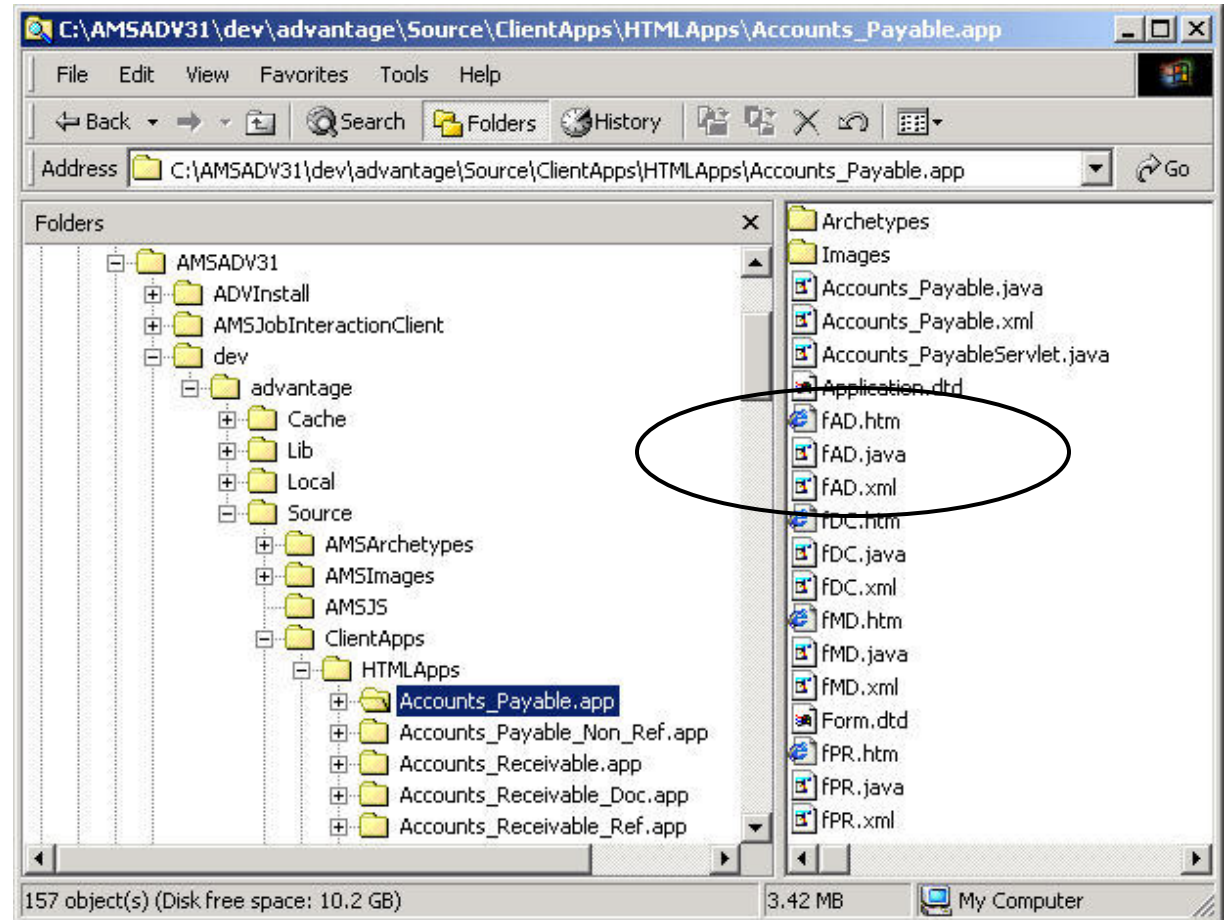


Application File Structure

Application files are stored in the ClientApps folder.

For each page there is a html, xml and java file.

The page java file can contain any custom logic code for the page, as well as comments describing any HTML customizations on the HTML page.



\\AMSADV3\dev\advantage\Source\ClientApps\HTMLApps\<application>\

Pages – File Structure

A page is what is represented to the end user.

- **File Structure** (6 primary files for every page)
 - *.XML Source file – Master file
 - *Base.java Rebuilt file – Versata generated java based on XML (REBUILD)
Note: Never manually modified
 - *.java Source file – Custom java code
 - *Base.class Executable file created after *Base.java (COMPILE)
 - *.class Executable file created after *.java (COMPILE)
 - *.htm Source/Rebuilt/Executable file

Note: All HTM Customizations are lost when page layout is rebuilt

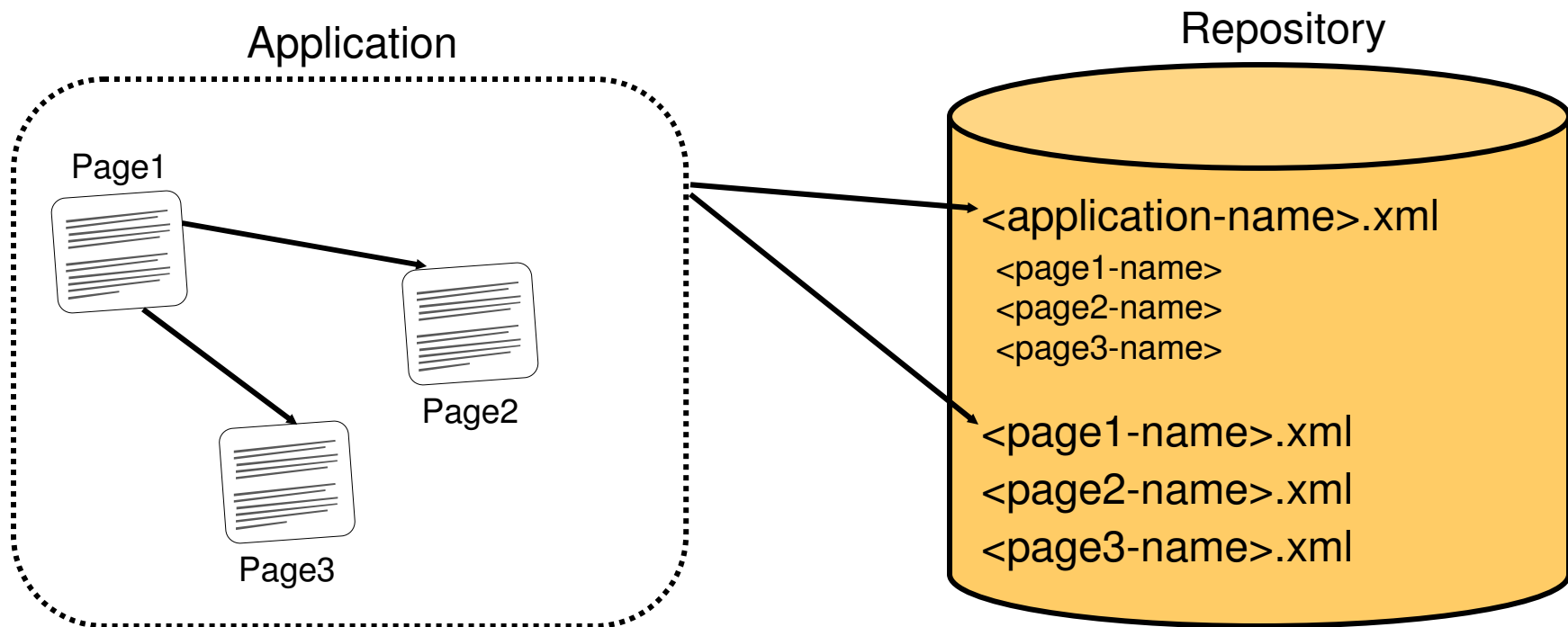
Page Types

- **Types of pages**

- Documents Prefix = f* (e.g. fENRL)
- Activity Folders Prefix = af* (e.g. afPE)
(HRM)
- Reference Pages Prefix = p* (e.g.
pR_SC_EFF_USER)

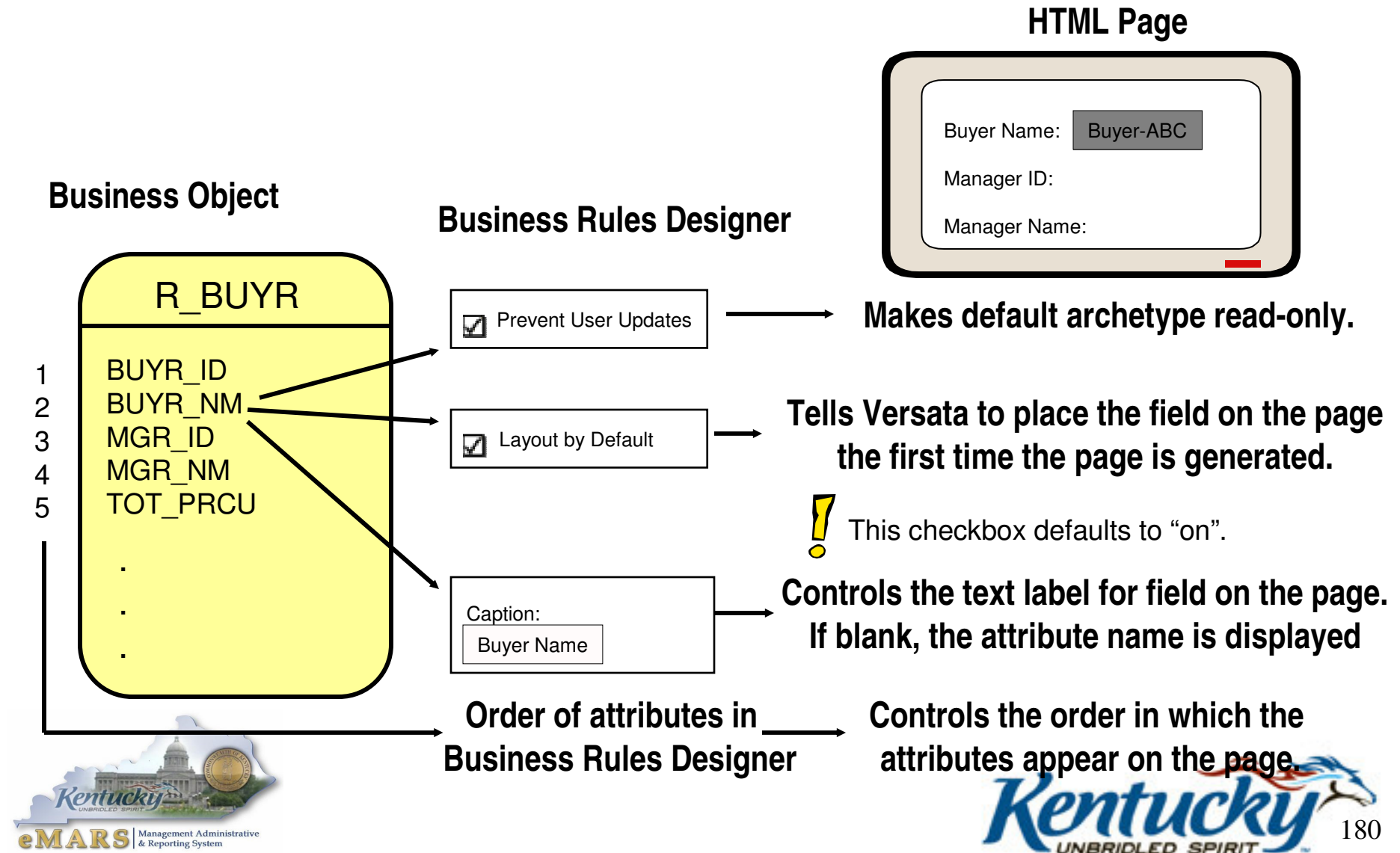
- All pages reside in a Client Application

Repository Files Created for Pages

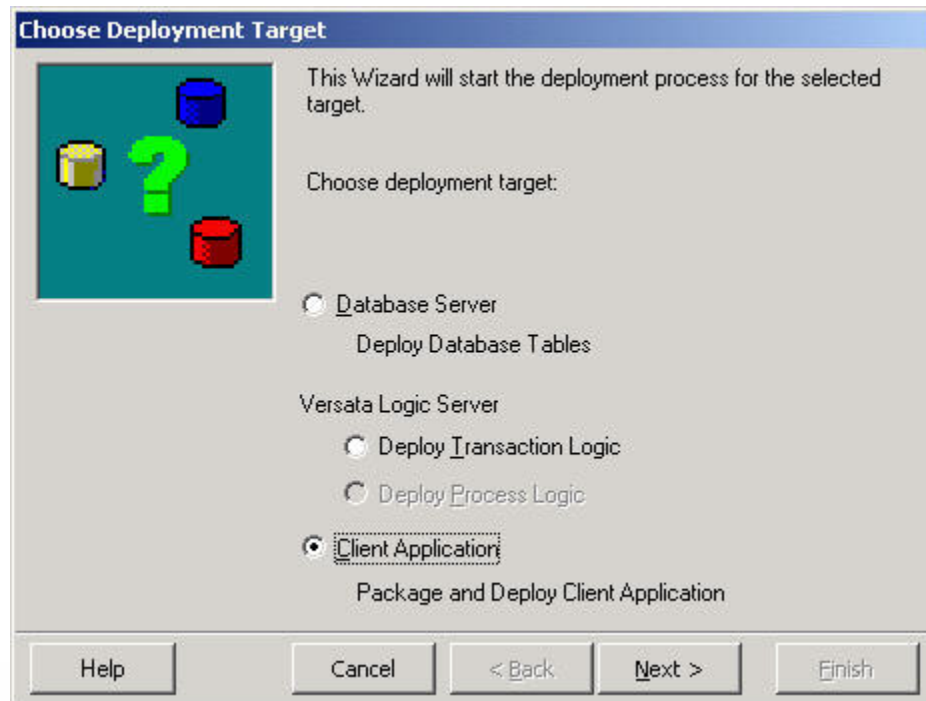
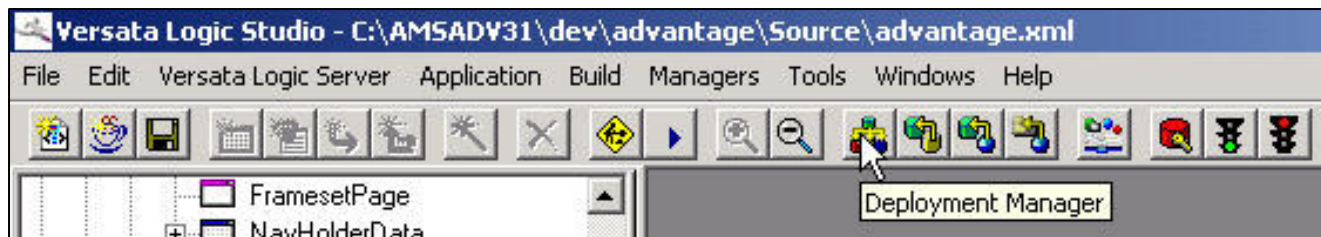


Versata creates/updates an XML file for each page and modifies the information in the application's XML file.

How Settings in Business Objects Affect HTML Pages



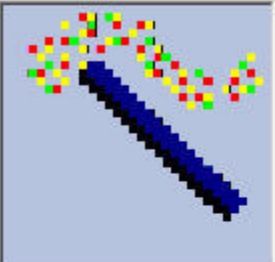
Deployment to the Client



Copies class and HTML files to a directory accessed by the Versata Logic Server and Web Server

Deployment to the Client

HTML Application Deployment Wizard - Introduction



The HTML Application Deployment wizard will deploy the application to the Web Server and the Versata Logic Server

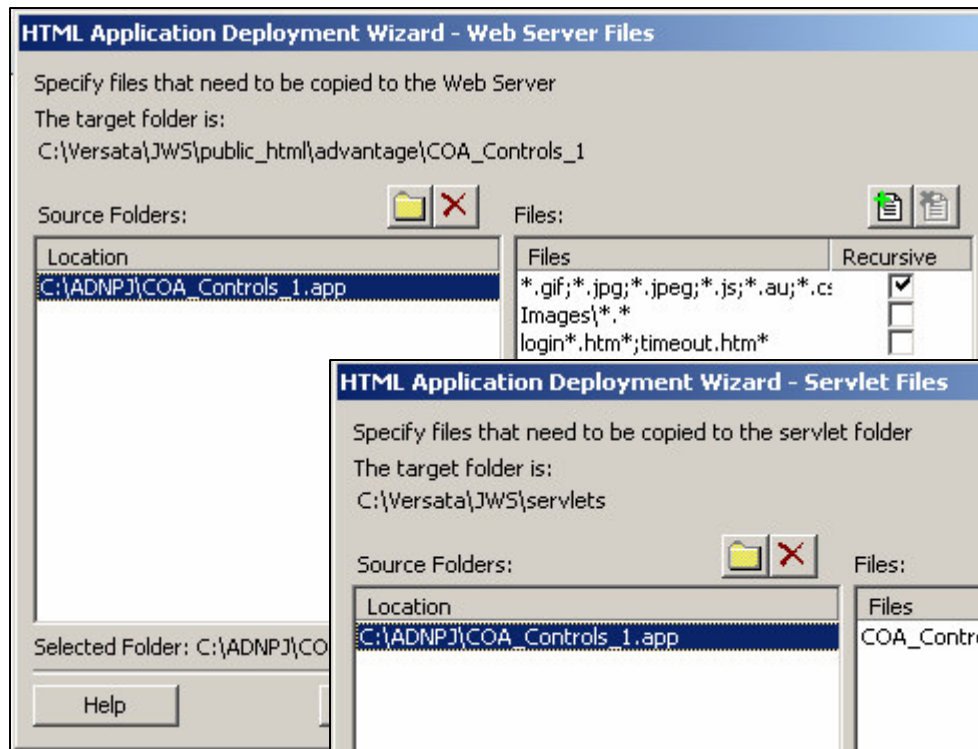
Versata Logic Server install folder:
C:\AMSAPPS\VersataD

Web Server root folder:
C:\AMSAPPS\IBMHTTPServer\htdocs

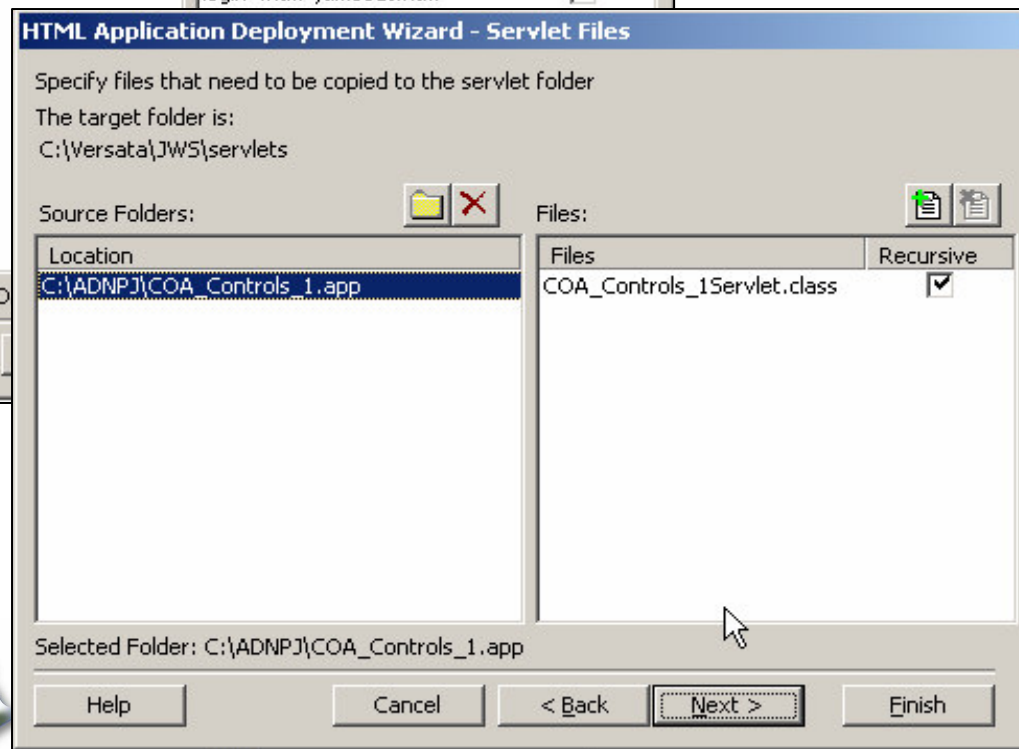
Help Cancel < Back Next > Finish

Verify VLS
install directory

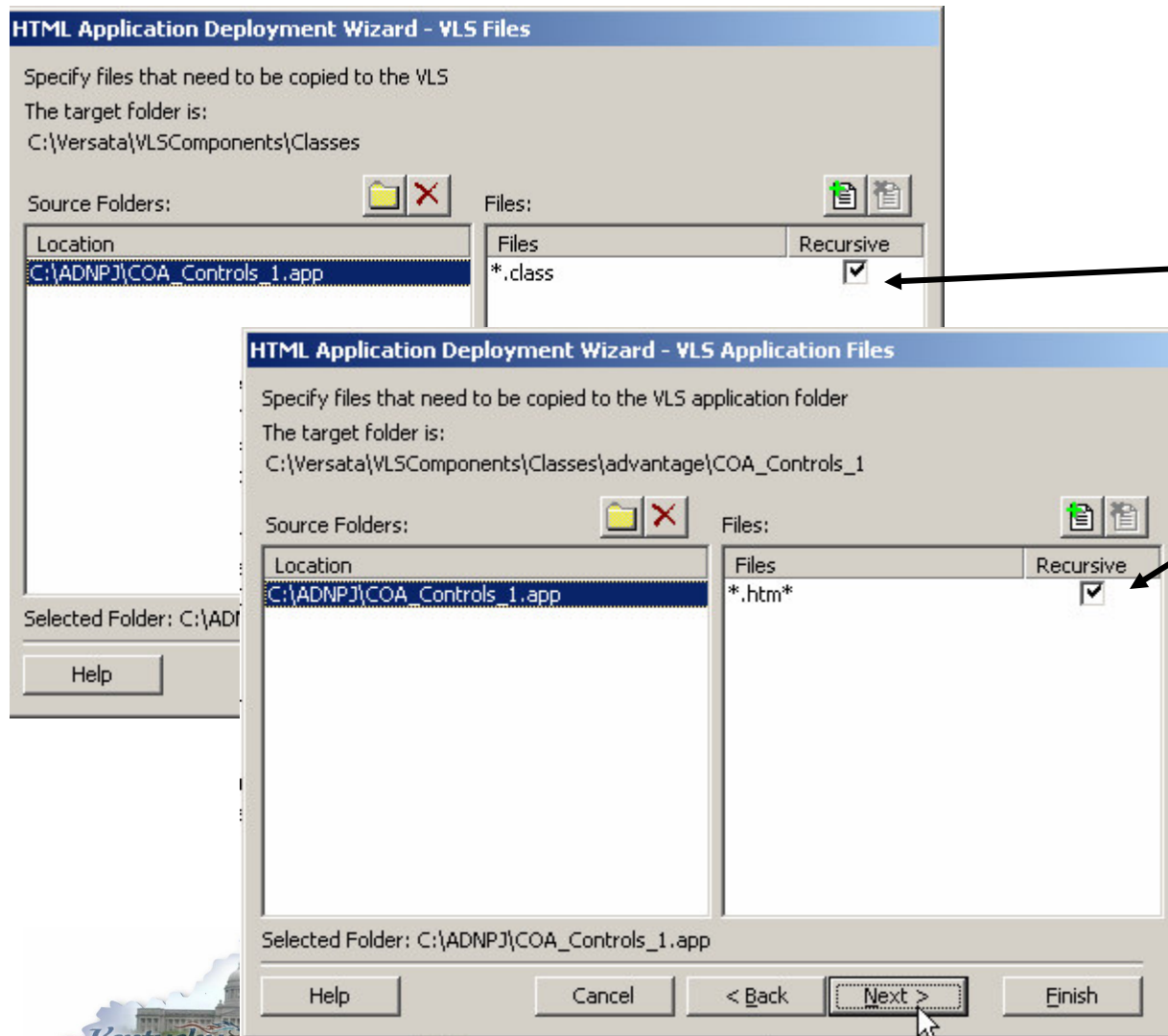
Deployment to the Client



Select Files to
Copy



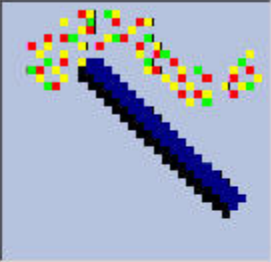
Deployment to the Client



Make sure to copy
the .class and .htm
files!

Deployment to the Client

HTML Application Deployment Wizard - WebSphere Registration



HTML Applications must be registered in to WebSphere in order to execute. This process can take some time and need only be done once.

☒ Register HTML Application to WebSphere

Please specify which AppServer and WebApp to deploy to.


WebSphere AppServer Name:

WebSphere WebApp Name:

Help Cancel < Back Next > Finish

Specify VERSATA for AppServer and advantage for the WebApp

HTML Application Deployment Wizard - Finished



The HTML Application Deployment wizard has finished collecting information.

Please press Finish to deploy.

Host:
npowers-24557

Server:
npowers-24557

☒ Overwrite files without confirmation

☒ Restart WebSphere Applications

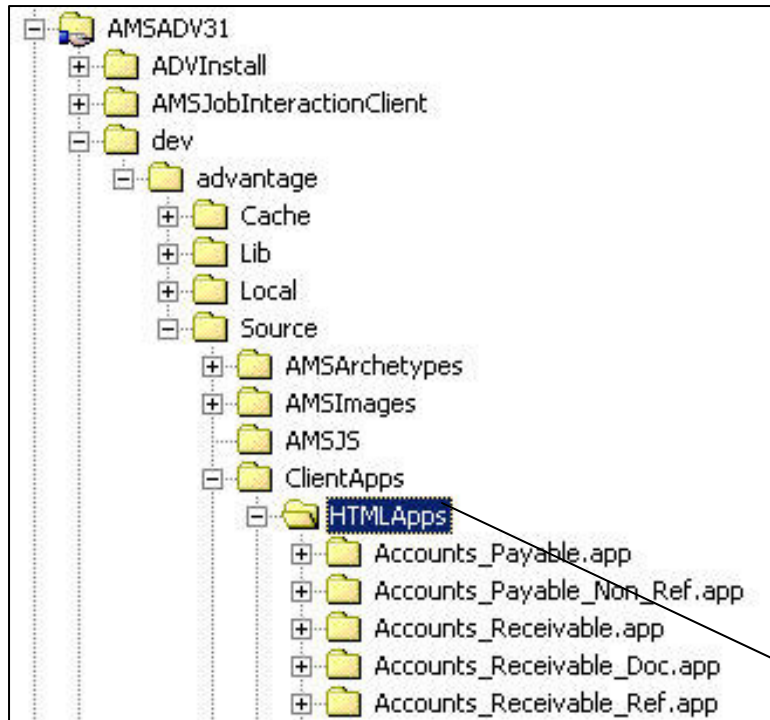
IMPORTANT: This will not start the WebSphere Application Server. Start the application server from the Studio Toolbar button.

Help Cancel < Back Next > Finish

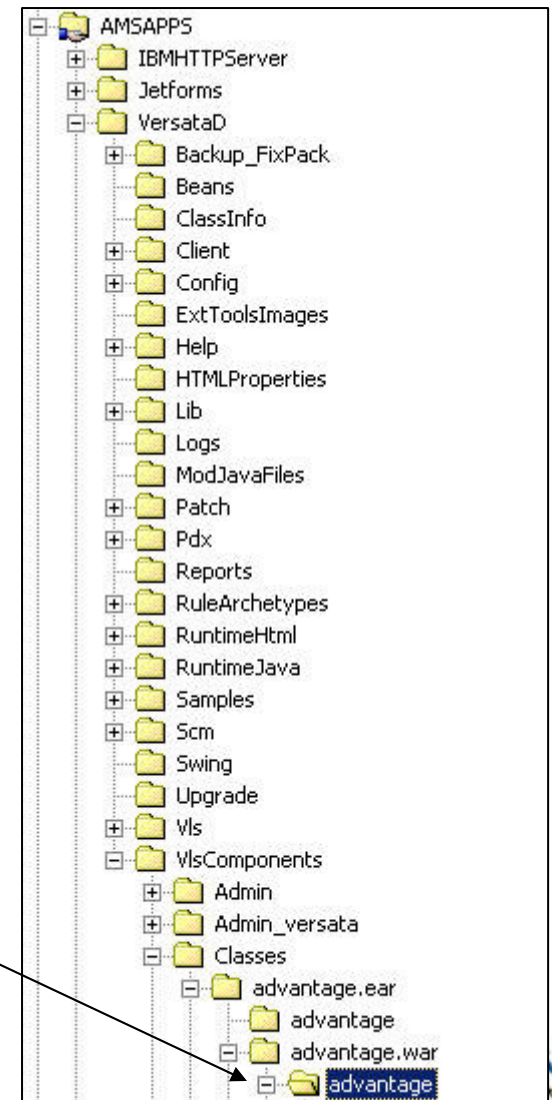
Check restart server, or restart manually.

Check overwrite existing files on the Server.

Deployment to the Client

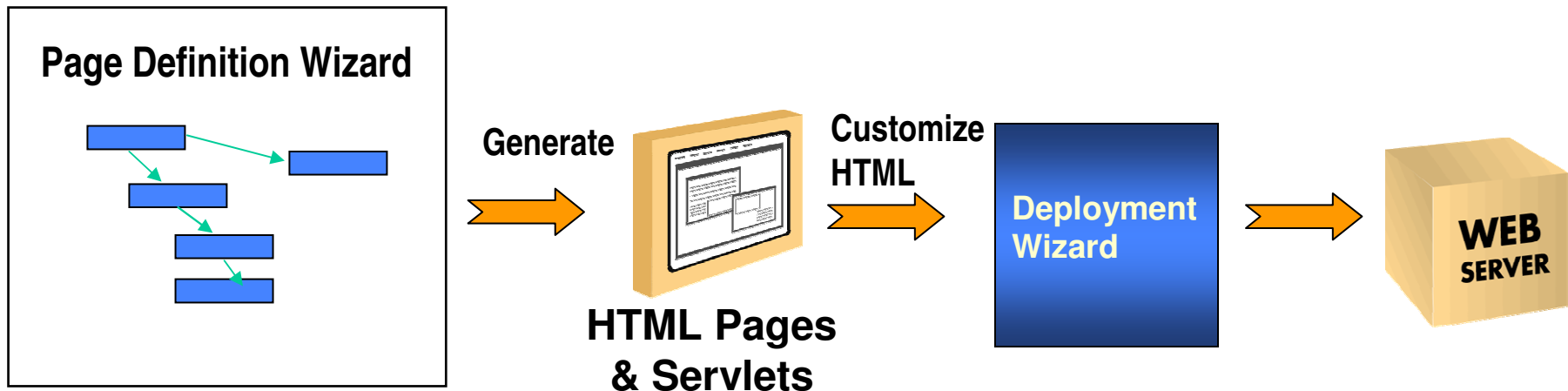


The Versata Deployment copies compiled classes and HTML files from the AMSADV3 directory to the AMSAPPS directory.



HTML Client Can Be Automatically Deployed (recap)

Design Studio



Register a New Page in the Application

User Name : sa
Password :
Server Name : <localBlsServer>
Login

Login to the application as 'sa'.
The password is 'advantage'

Click on the 'Edit Application Pages' business function

AMS ADVANTAGE 3.0

Welcome, System Admin Security Administration **Application Administration** Approval Administration

[Save All](#) [Close](#)

Page Administration
[Setup Application Pages](#)
[Setup Page Leafing](#)
Navigation Administration
Workgroup Administration
Batch Administration
Miscellaneous

Page Administration
Setup and maintain application pages.

Setup Application Pages
This business function allows you to setup and maintain the application

Edit Application Pages

Setup Page Leafing
This business function allows you to setup and maintain application p

Register a New Page in the Application

Add a unique page code (only 8 characters)

Choose a Category (functional area)

Choose the type of page (usually Reference Table)

Enter a Description for page

Enter the Client Application where your page exists (this must be exact!)

Now finally enter the name of your page (this must be exact!)

Select Mode that you want your page to open in. Browse, Add or Query?

You could select an Order By clause here!

Searchable or hidden?

Page Code : 1099I

Category : Accounts Payable

Page Type : Reference Tables

Description : 1099 Reporting Information

UI Package : Receivable_Payable_Refe

Application : ADVANTAGE Financial

Dest Page : pR_TIN_1099_INFO_Gene

Dest Frameset :

Dest Frame :

Target Frame : Display

Help Sub Directory : Accounts_Payable

Help File Name : 1099_Reporting_Informatio

Initial Mode : Browse

Order By :

Where Clause :

Searchable? : ☒

Organization Codes

Branch : Division : District :

Cabinet : Group : Bureau :

Department : Section : Unit :

Organization Codes

Branch : Division : District :

Cabinet : Group : Bureau :

Department : Section : Unit :

Organization Codes

Branch : Division : District :

Cabinet : Group : Bureau :

Department : Section : Unit :

Common Problems

- Common issues often appear
- Practice helps identify solution

Common Problems


- Trying to start application without starting http server



The page cannot be displayed

The page you are looking for is currently unavailable. The Web site might be experiencing technical difficulties, or you may need to adjust your browser settings.

Please try the following:

- Click the  Refresh button, or try again later.
- If you typed the page address in the Address bar, make sure that it is spelled correctly.
- To check your connection settings, click the **Tools** menu, and then click **Internet Options**. On the **Connections** tab, click **Settings**. The settings should match those provided by your local area network (LAN) administrator or Internet service provider (ISP).
- If your Network Administrator has enabled it, Microsoft Windows can examine your network and automatically discover network connection settings. If you would like Windows to try and discover them, click  [Detect Network Settings](#)
- Some sites require 128-bit connection security. Click the **Help** menu and then click **About Internet Explorer** to determine what strength security you have installed.
- If you are trying to reach a secure site, make sure your Security settings can support it. Click the **Tools** menu, and then click **Internet Options**. On the Advanced tab, scroll to the Security section and check settings for SSL 2.0, SSL 3.0, TLS 1.0, PCT 1.0.

Common Problems

- Solution: Start http server (either way)



Common Problems

- Trying to start application without starting websphere

Internal Server Error

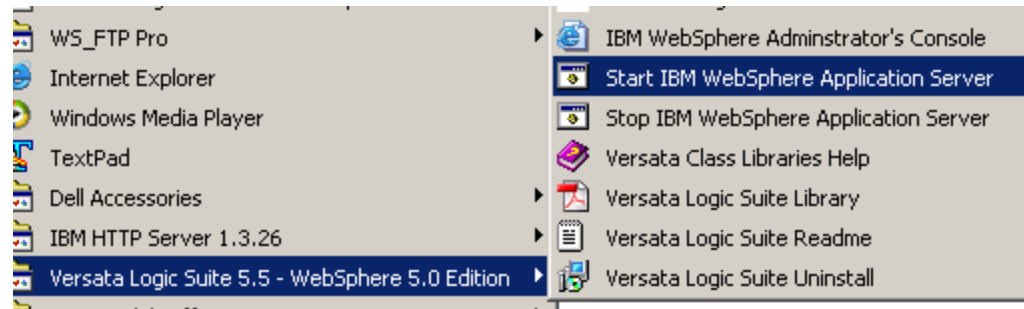
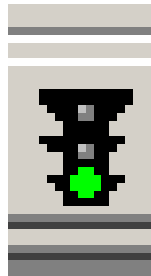
The server encountered an internal error or misconfiguration and was unable to complete your request.

Please contact the server administrator, [you@your.address](#) and inform them of the time the error occurred, and anything you might have done that may have caused the error.

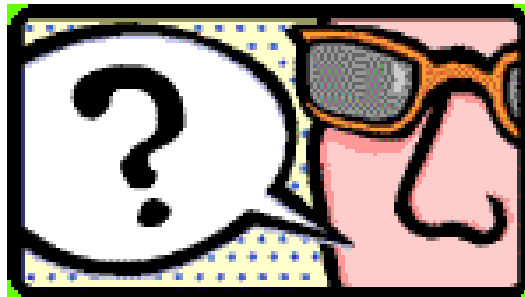
More information about this error may be available in the server error log.

Common Problems

- Solution: start websphere (either way)



Questions!



AMS ADVANTAGE[®] 3

Application Development

Day 3 : Server Deployment and
Customizations



Objectives for the Day

- Review
- Common Errors
- Server Deployment
- Learn how custom code is used
- Become familiar with the Order of Operations
- Learn about Infrastructure Classes
- Learn several debugging techniques

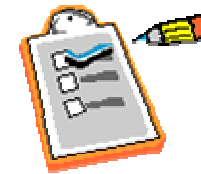
Today's Agenda

Morning

- Review development process
- Page Structure
- Lunch break

Afternoon

- Exercise



Review Development Process

AMS ADVANTAGE® 3
Application Development



Typical Development Path

- ☐ Reserve files in CM tool (Checkout/Lock)
- ☐ Create/Update business objects
- ☐ Build/rebuild java code
- ☐ Add custom code to generated java file
- ☐ Compile
- ☐ Deploy to VLS
- ☐ Deploy to database
- ☐ Create/update application pages
- ☐ Build/rebuild java and html

- ☐ Apply/reapply custom html if necessary
- ☐ Add/update custom java code if necessary
- ☐ Compile
- ☐ Deploy to the client
- ☐ Start Web server
- ☐ Start application server
- ☐ Test/Debug
- ☐ Check in updated files into CM tool

Repository Objects

4 Primary types of objects in ADVANTAGE

- Data Objects
- Query Objects
- Pages (Includes documents, reference pages, activity folders)
- 'OTHER FILES' Java Programs

Advantage.xml

```
<DataObjects>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG</DataObject>
  <DataObject>DataObjects\Infrastructure\AuditLog\IN_AUD_LOG_CTL</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BF_ITEM_ST</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_JOB_PRTY</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_NODE_TYPE</DataObject>
  <DataObject>DataObjects\Infrastructure\CVL\CVL_BS_RUNPOLICY</DataObject>

<QueryObjects>
  <QueryObject>QueryObjects\Infrastructure\DocEngine\OBJ_ATT_ALT_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\FormsPrinting\PRNT_JOB_SRV_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_FLDR_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\RPT_SRCH_TBL_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\JobFramework\VIEW_ALL_JOBS_QRY</QueryObject>
  <QueryObject>QueryObjects\Infrastructure\Navigation\q_InPages</QueryObject>

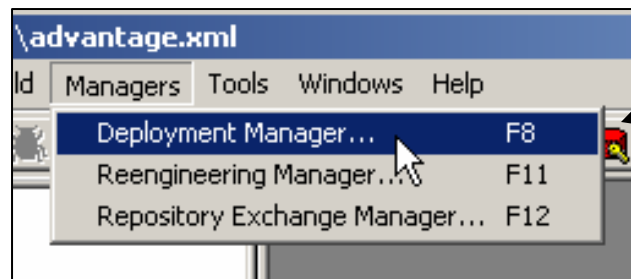
<Relationships>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-IN_DOC_CREA_ACTN</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_SC_USER_DOC_COMP</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV</Relationship>
  <Relationship>DataObjects\Financial\Common\REL_R_GEN_DOC_CTRL-R_WF_APRV_COMP</Relationship>

<HTMLApplications>
  <Application>Advantage</Application>
  <Application>GenMRT</Application>
  <Application>PasswordReset</Application>
  <Application>Prototype</Application>
```

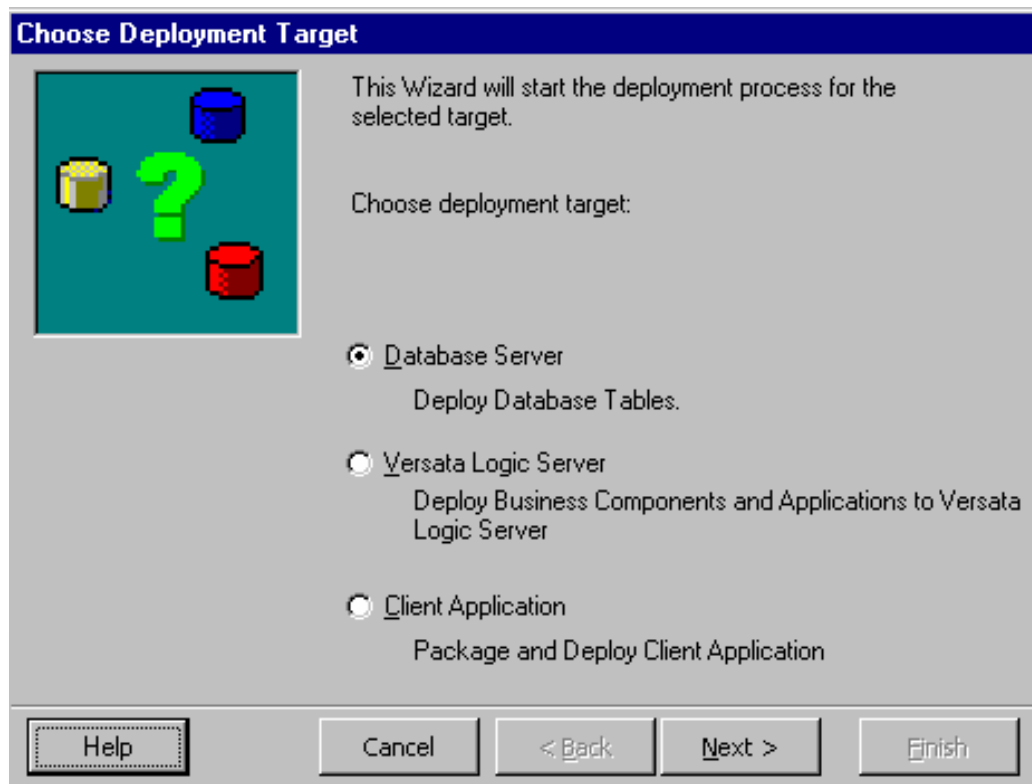
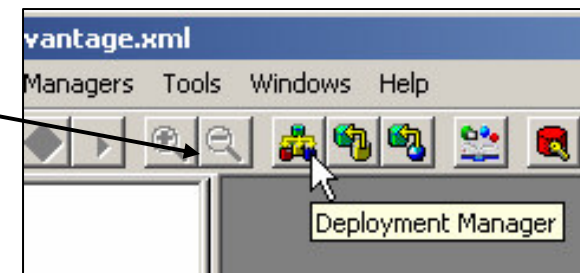
Page xml

```
<?xml version="1.0"?>
<!DOCTYPE Application SYSTEM "Application.dtd">
<Application
  SurrId="0463593560.bgomolka.0007"
  TargetLanguage="HTML"
  DefaultLogonUserId="sa"
  ExecutionEnvironment="Browser"
  AppletHeight="575"
  AppletWidth="725"
  ClassId="6FC5012A-A1D4-450A-90E1-3F086CB519AA"
  SuppressDefaultLoginScreen="False"
  InitialFramesetPage="FramesetPage"
  StartupPageFrameName="Startup"
  InitialFrameNameForStartupTrans="Display"
  AppRepositoryVersion="05.05.13"
  DeploySecurityInfo="False"
  DTDVersion="05.05.12"
>
  <ServerLocation><![CDATA[<localVLSServer>]]></ServerLocation>
  <!-- APPLICATION FORMS -->
  <Forms>
    <Form>StartupPage</Form>
    <Form>pNoData</Form>
    <Form>pR_DEPT_OBJ_RSRC</Form>
    <Form>pPX</Form>
    <Form>pR_DEPT_OBJ_RSRC_MOD</Form>
  </Forms>
  <SourceFiles>
  </SourceFiles>
</Application>
```

Deployment Manager



Open the
Deployment
Manager – one
of two ways



Deployment manager
has options for
Database, VLS and
Application
deployment.

Deployment Review – 3 Types

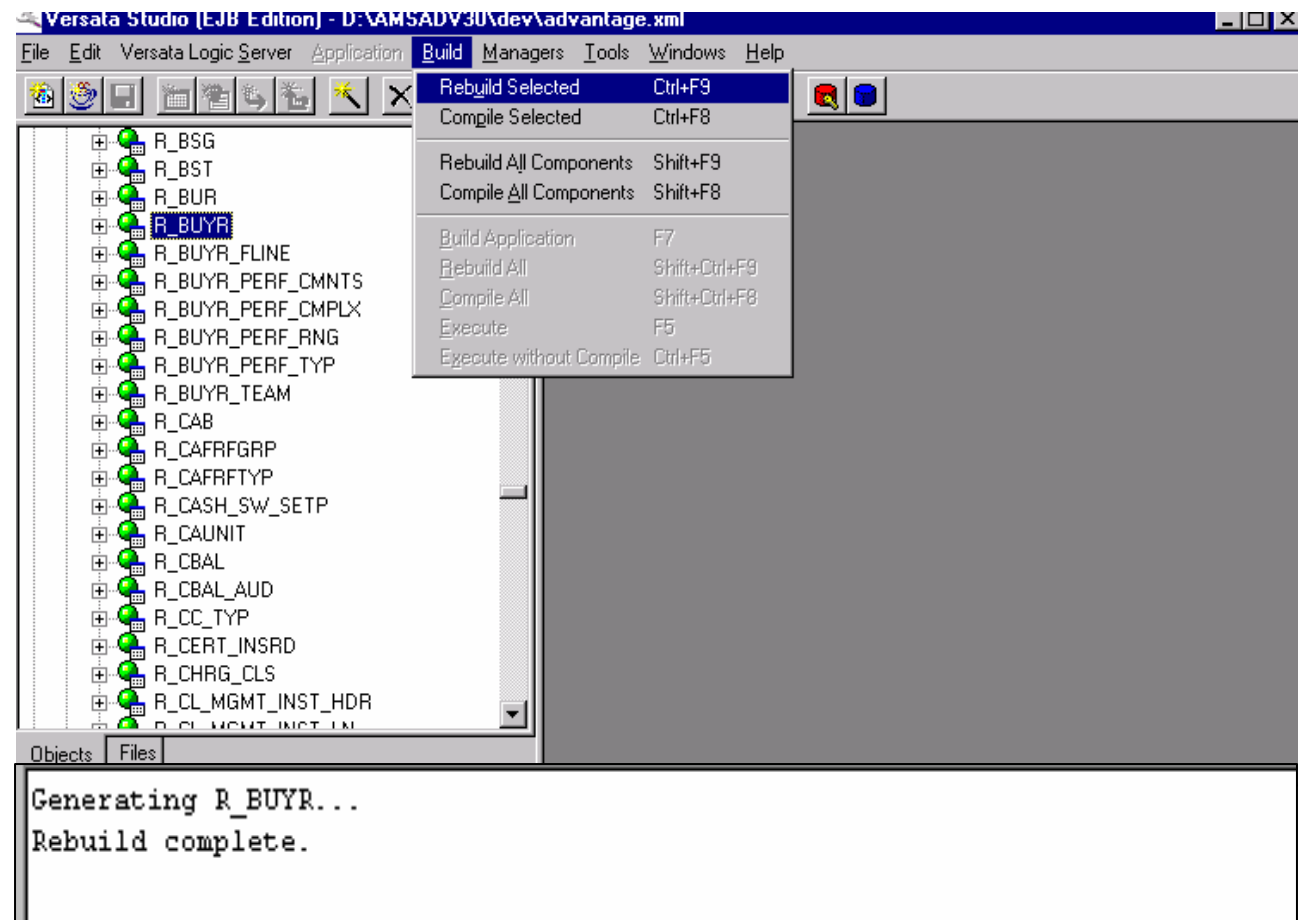
3 Types of Deployment

- **Database Deployment**
 - New Data Objects (tables)
 - Changes to physical layout of existing Data Objects (e.g. adding 'persistent' fields, changing field lengths, field types.
 - Generates SQL Scripts
- **VLS Deployment**
 - New Data Objects or Query Objects
 - Changes to existing Data Objects or Query Objects
- **Client Deployment**
 - New pages
 - Changes to existing pages.

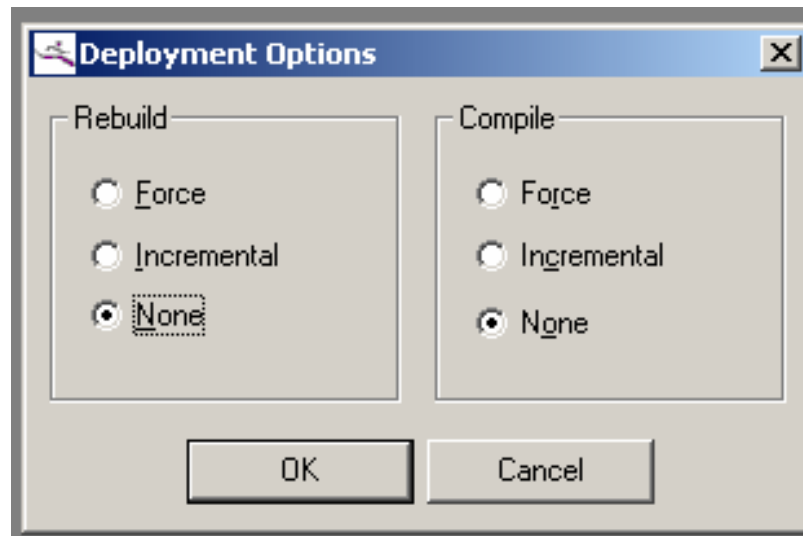
Rebuilding the Data/Query Object

First select the object and then choose 'Rebuild Selected' option from Build menu.

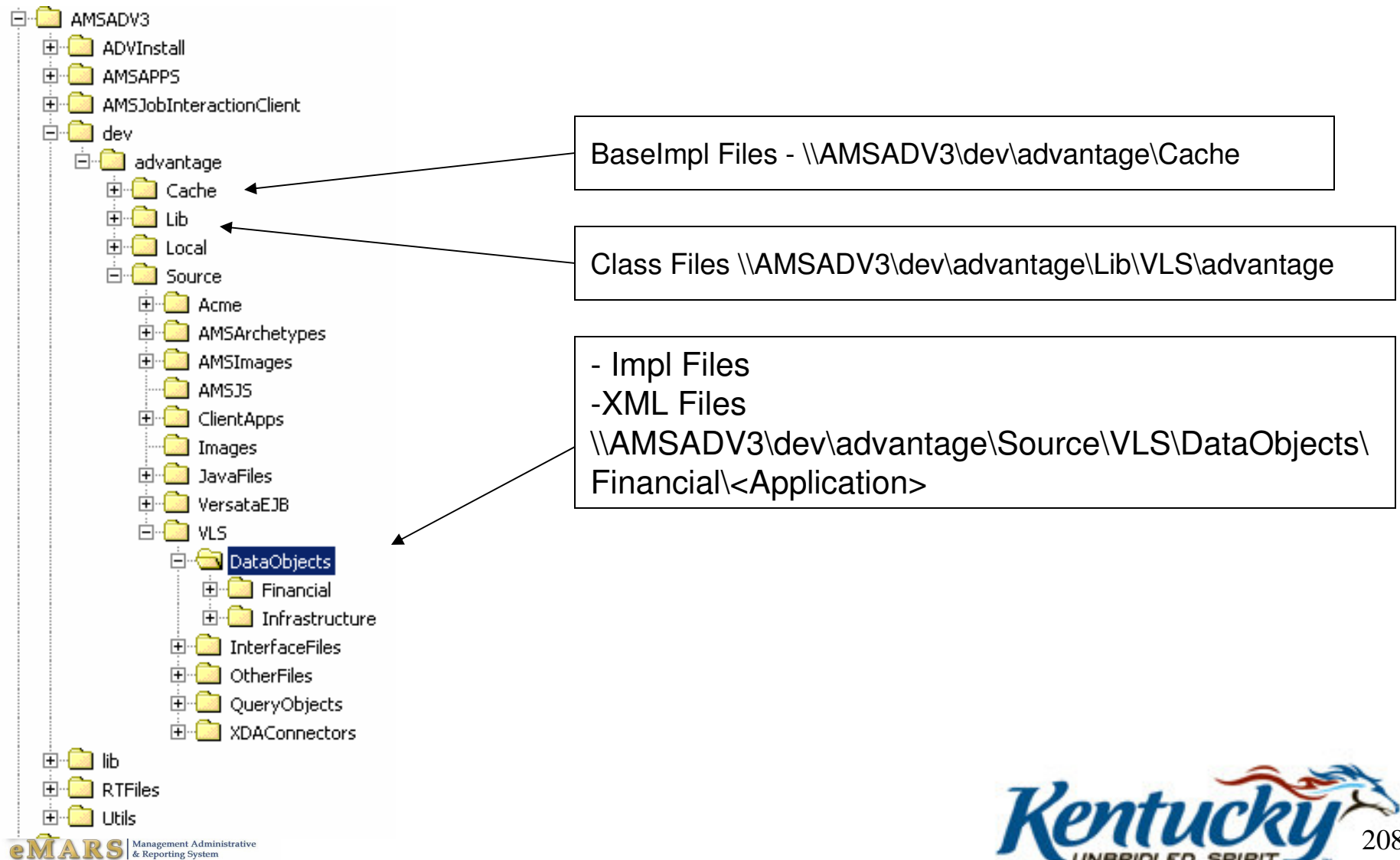
Message area tells you when the action is complete



Deployment Manager



Directory Structure Recap



Assign Privileges to New Objects

Versata Logic Server Console

Public

Privileges | Users | Properties

Applications | **Business Objects** | System Privileges

(All)

☐ Data Objects ☐ Query Objects ☒ Both

Object Name	Read	Create	Update	Delete
advantage.ABS_DOC_ACTG	✓	✓	✓	✓
advantage.ABS_DOC_HDR	✓	✓	✓	✓
advantage.ABS_DOC_VEND	✓	✓	✓	✓
advantage.AD_CR_MMO_REC_SEL	✓	✓	✓	✓
advantage.AD_DOC_ACTG				
advantage.AD_DOC_HDR	✓	✓	✓	✓
advantage.AD_DOC_VEND	✓	✓	✓	✓
advantage.AD_PYMT_SLCT	✓	✓	✓	✓
advantage.AGCY_PER	✓	✓	✓	✓

Grant Read
Grant Create
Grant Update
Grant Delete
Grant All
Remove All

Properties | Methods | Attributes

Once a new Object is registered with the VLS, access rights must now be assigned.

Click "Grant All" for Read, Create, Update and Delete. Or select new object from the list and check rights manually.

Privileges can be assigned under Administration\Roles\Public

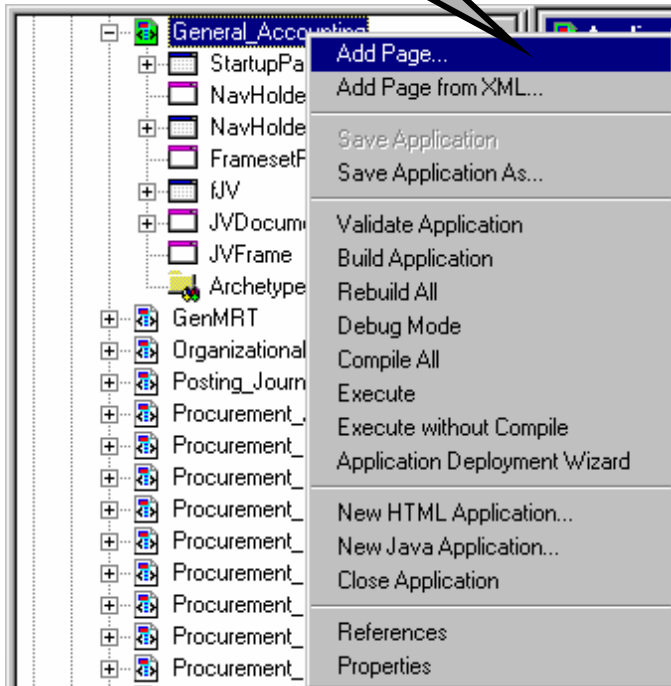
Business Objects Tab

eMARS Management Administrative & Reporting System

UNBRIDLED SPIRIT

Creating a Page: Studio Wizard

Right click, then
"Add Page"



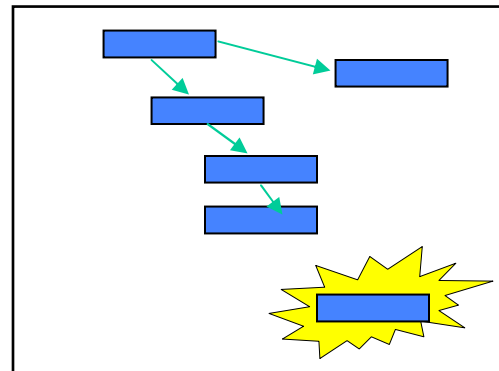
New Page Wizard



1. Select the main data source and page type
2. Select the display style (archetype)
3. Select the page style (archetype)



Application Designer



New page appears
in Application Designer

ADVANTAGE Page Layout

Inventory Maintenance Quick Search

Sortable Field

Page Title

Warehouse	Stock Item	Description	Unit Price	Available	Primary Bin
DED	07008	Bookmobile	8000.000000	100.00000	1
DED	0700801	Bookmobiles - Engine & Parts	25.000000	90.00000	1
DED	07030	School Bus Chassis	25.000000	90.00000	1
DED	99818 01	9th Grade Biology	25.000000	25.50000	1
DED	99818 02	9th Grade Math	25.000000	90.00000	1

First Prev Next Last

Page Actions

Save Undo Delete Insert Copy Paste Search

Expand/Collapse All

Search Window

Search

Warehouse: Stock Group:

Warehouse Description: ABC Class:

Stock Item:

Stock Item Suffix:

Description:

Ok Clear Cancel

Tab 1

Note the different attribute archetypes.

General Information

Warehouse: DED
This warehouse stores schools supplies

Stock Item: 07030

Stock Item Suffix:

Description: School Bus Chassis

Suggested Vendor: AMS-01
SL&S

Quantity per Issue: 1.00000

ABC Class: ABC1
Default ABC Classification.

Stock Group:

Parent Item: ☐

Frozen for Accounting: ☐

Costing Method: Average Costing

Unit Cost: 25.000000

Extended Cost: \$2,250.00

Issue Unit: EA

Purchase Unit: EA

Multiplier: 1

Smaller Unit: Issue Unit

Keyword Search: Issue Unit
Purchase Unit

Extended Description:

CVL

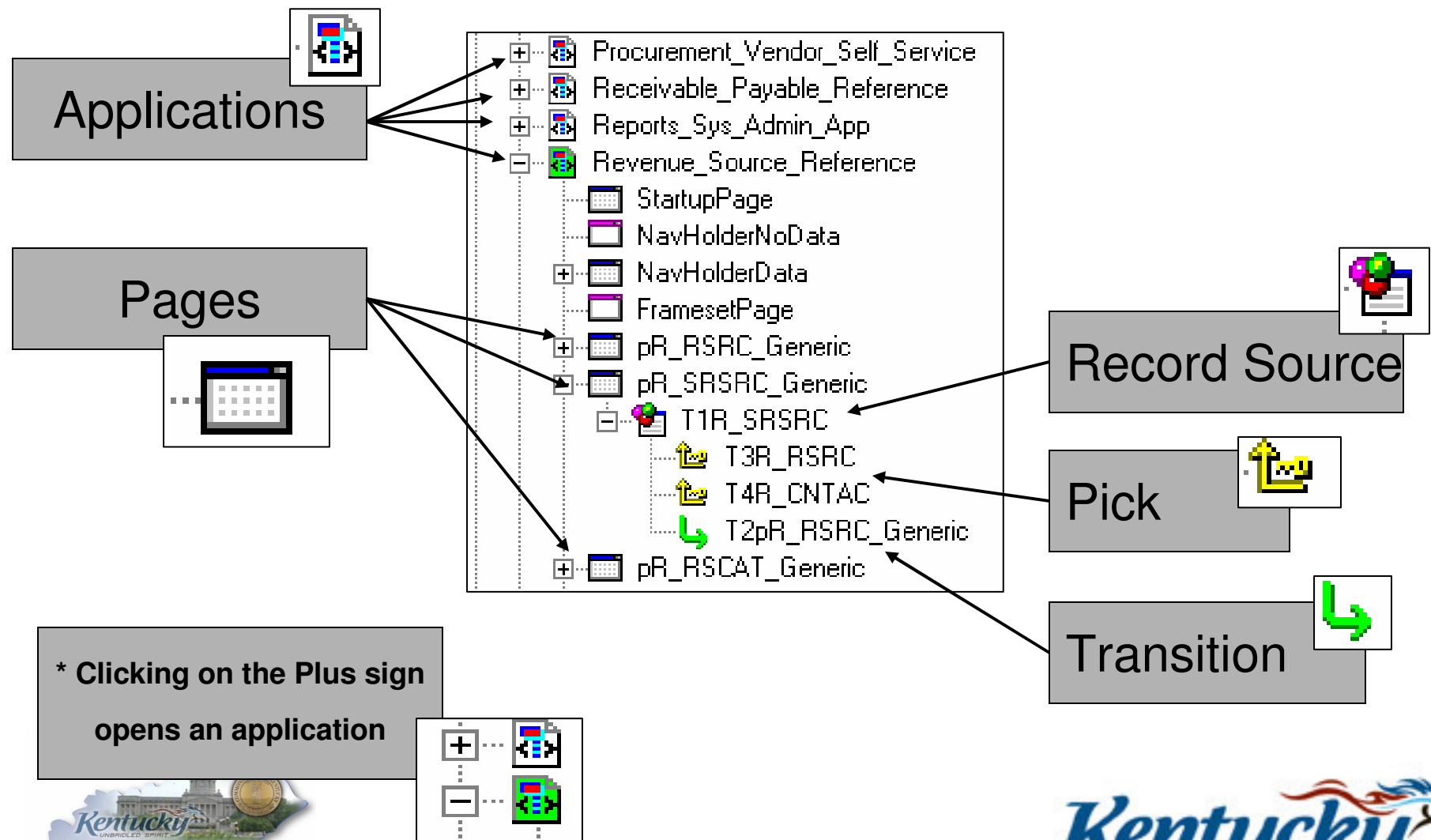
Scalar

Pick List

Kentucky eMARS Management Administrative & Reporting System

Kentucky UNBRIDLED SPIRIT

Client Application Objects



* Clicking on the Plus sign
opens an application

Record Source Properties - Main



RecordSource Properties - T1R_INVN

Main | Query | Attributes | HTML Object

Data/Query Object Name: R_INVN
Prefix for Elements: T1

RecordSource Archetype: AMSGenericGridDisplay

Extended Archetype Properties

DetailsCaption	
DownloadFileType	none
New_Column_Fields	%COST_METH%%MAX_SRCHRG%%INVN_ACCT_C



Extended Archetype Properties

DetailsCaption	
DownloadFileType	none
New_Column_Fields	%COST_METH%%MAX_SRCHRG%%INVN_ACCT_C
ObjectAttachments	false
showCopyPaste	true
showSearchWin	true
SummaryCaption	
Tab_10_Delimiter	
Tab_10_Name	
Tab_1_Delimiter	%WSE_CD%
Tab_1_Name	General Information
Tab_2_Delimiter	%PRICE_METH%
Tab_2_Name	Pricing
Tab_3_Delimiter	%INVN_OBJ_CD%
Tab_3_Name	Inferred COA Elements

Property: DetailsCaption
Value:
Valid Values:
Close

Format:
%Field1%%Field2%

Format:
%Field Name%

New Column Fields

Tab n Delimiter

Extended Archetype
Properties

nce

Item	Description	Unit Price	Available	Primary Bin
	Bookmobile	8000.000000	100.00000	1
	Bookmobiles - Engine & Parts	25.000000	90.00000	1
DED 07030	School Bus Chassis	25.000000	90.00000	1
DED 99818 01	9th Grade Biology	25.000000	25.50000	1
DED 99818 02	9th Grade Math	25.000000	90.00000	1

First Prev Next Last

Save Undo Delete Insert Copy Paste Search

General Information

Pricing

Pricing Method: Standard Price with No Surcharge Maximum Surcharge: 0.000000
Unit Price: 8000.000000 Standard Price: 8000.000000
Percent Surcharge: 0.00 Maximum Issue: 99999.99999
Fixed Surcharge: 0.000000 Minimum Issue: 0.000000

Inferred COA Elements
Location
Reorder Information

Record Source Properties - Attributes



The Record Source Properties determine which attributes will be displayed on the page, both the scalar and grid.

Attributes can be moved up or down to change display order.

Select an attribute and select Displayed, or Not Displayed

RecordSource Properties - T1R_INVN

Main | Query | Attributes | HTML Object

Scalars | Grid

Reset to Defaults

Displayed on Page

Not Displayed on Page

Display All Required

Archetype ☒ Use System Default

PickChoice

Transition Object to Use

n/a

** Not displayed.

Choose Archetype

Archetypes

OptionButton

OptionButtonReq

Password

PasswordReq

PickAccept

PickChoice

PickChoiceReq

QueryCombobox

Description

a data bound control to perform a parent lookup via a second page.

Archetypes: Repository

OK

Cancel


Attribute Archetype

Common Attribute Archetypes

PickChoice
DisplayOnlyTextNoLabel

Warehouse : 
This warehouse stores schools supplies

ComboBox
DisplayOnlyText2

Costing Method : 
Unit Cost : 0.000000

CheckBox

Parent Item : ☒

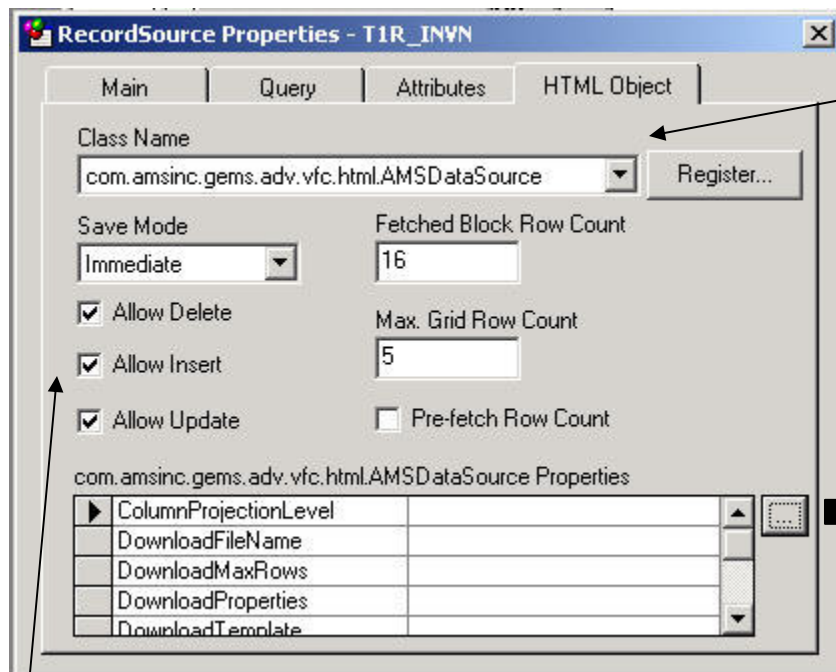
AMSDateChoiceCalendar

Effective From : 

TextBoxMemo

Description :

Record Source Properties – HTML Object

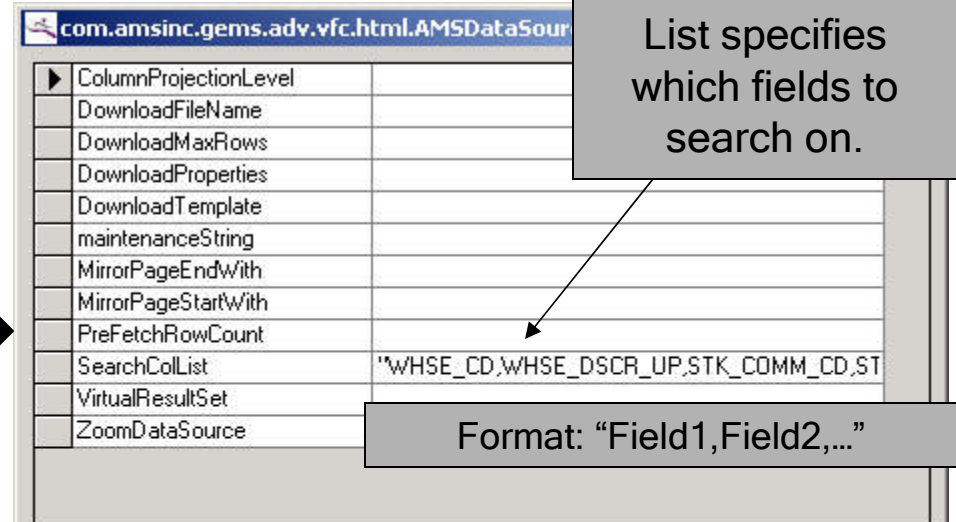


The dialog box has four tabs: Main, Query, Attributes, and HTML Object. The HTML Object tab is selected. It contains the following fields and controls:

- Class Name:** A dropdown menu showing `com.amsinc.gems.adv.vfc.html.AMSDataSource` and a `Register...` button.
- Save Mode:** A dropdown menu set to `Immediate`.
- Fetch Block Row Count:** A text box containing the value `16`.
- Max. Grid Row Count:** A text box containing the value `5`.
- Allow Delete:** A checked checkbox.
- Allow Insert:** A checked checkbox.
- Allow Update:** A checked checkbox.
- Pre-fetch Row Count:** An unchecked checkbox.
- com.amsinc.gems.adv.vfc.html.AMSDataSource Properties:** A list box containing:
 - `ColumnProjectionLevel` (selected)
 - `DownloadFileName`
 - `DownloadMaxRows`
 - `DownloadProperties`
 - `DownloadTemplate`

Always extend
AMSDataSource

Search Column
List specifies
which fields to
search on.



The dialog box shows the `com.amsinc.gems.adv.vfc.html.AMSDataSource` properties. It contains a list of properties and their values:

Property	Value
<code>ColumnProjectionLevel</code>	
<code>DownloadFileName</code>	
<code>DownloadMaxRows</code>	
<code>DownloadProperties</code>	
<code>DownloadTemplate</code>	
<code>maintenanceString</code>	
<code>MirrorPageEndWith</code>	
<code>MirrorPageStartWith</code>	
<code>PreFetchRowCount</code>	
<code>SearchColList</code>	<code>"WHSE_CD,WHSE_DSCR_UP,STK_COMM_CD,ST</code>
<code>VirtualResultSet</code>	
<code>ZoomDataSource</code>	

Format: "Field1,Field2,..."

- Allow Delete, Insert, Update fields correspond to those displayed on the page.
- Fetched Block Row Count is the number of records to fetched from the database, default is 16.
- Max Grid row count is the number of rows to display in the grid, default is 5

Edit window

Close

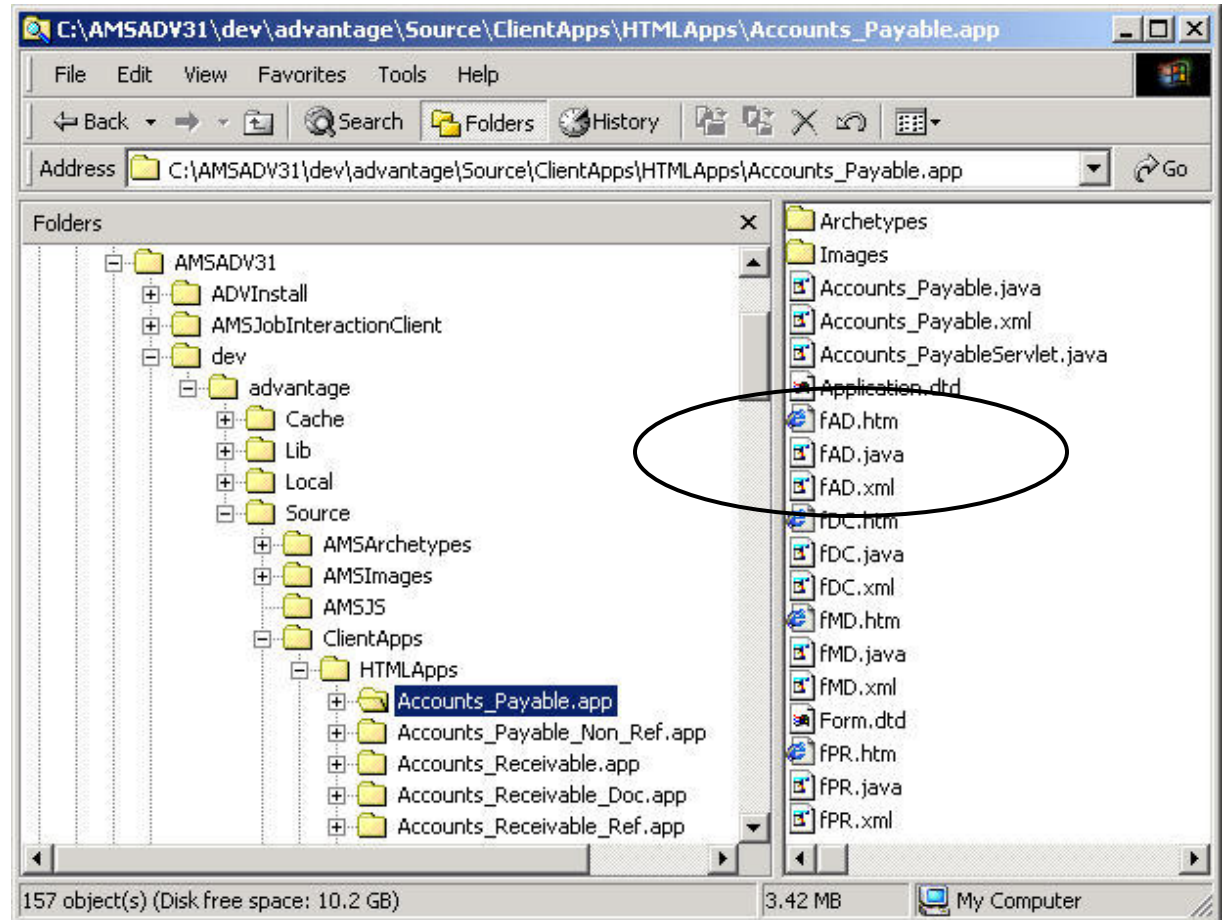
Properties must be properly typed. i.e. String properties must be enclosed in double quotes.

Application File Structure

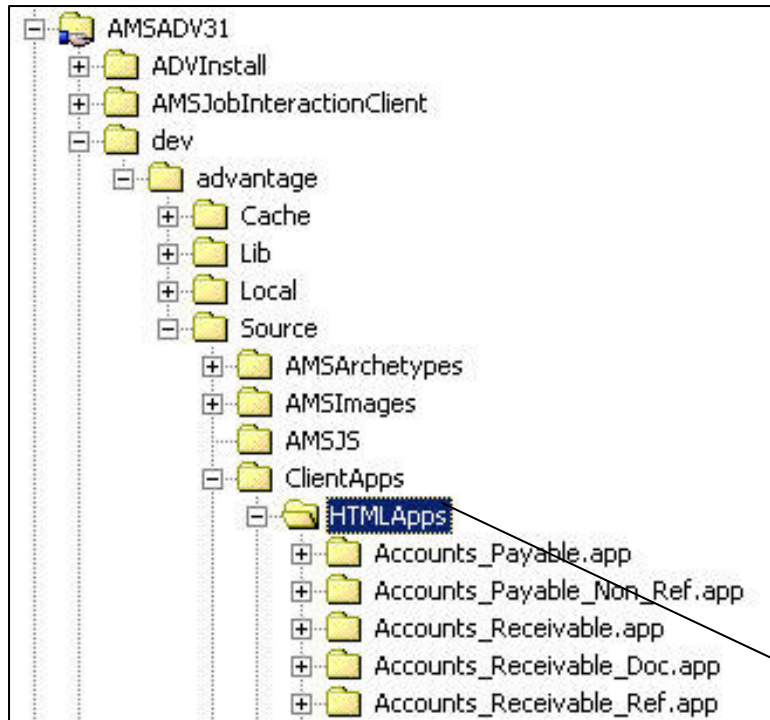
Application files are stored in the ClientApps folder.

For each page there is a html, xml and java file.

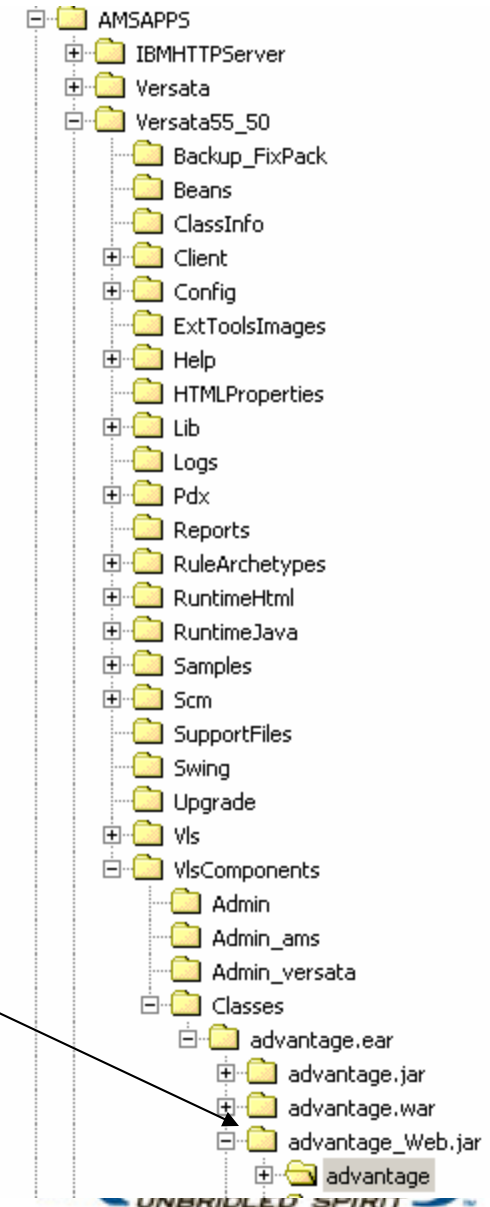
The page java file can contain any custom logic code for the page, as well as comments describing any HTML customizations on the HTML page.



Deployment to the Client



The Versata Deployment copies compiled classes and HTML files from the AMSADV3 directory to the AMSAPPS directory.



Register a New Page in the Application

User Name : sa
Password :
Server Name : <localBlsServer>

Login

Login to the application as 'sa'.
The password is 'advantage'

Click on the 'Edit Application Pages' business function

AMS ADVANTAGE 3.0

Welcome, System Admin Security Administration **Application Administration** Approval Administration

[Save All](#) [Close](#)

Page Administration

- [Setup Application Pages](#)
- [Setup Page Leafing](#)

Navigation Administration

Workgroup Administration

Batch Administration

Miscellaneous

Page Administration

Setup and maintain application pages.

Setup Application Pages

This business function allows you to setup and maintain the application

[Edit Application Pages](#)

Setup Page Leafing

This business function allows you to setup and maintain application p

Register a New Page in the Application

Add a unique page code (only 8 characters)

Choose a Category (functional area)

Choose the type of page (usually Reference Table)

Enter a Description for page

Enter the Client Application where your page exists (this must be exact!)

Now finally enter the name of your page (this must be exact!)

Select Mode that you want your page to open in. Browse, Add or Query?

You could select an Order By clause here!

Searchable or hidden?

Page Code : 1099I

Category : Accounts Payable

Page Type : Reference Tables

Description : 1099 Reporting Information

UI Package : Receivable_Payable_Refe

Application : ADVANTAGE Financial

Dest Page : pR_TIN_1099_INFO_Gene

Dest Frameset :

Dest Frame :

Target Frame : Display

Help Sub Directory : Accounts_Payable

Help File Name : 1099_Reporting_Informatio

Initial Mode : Browse

Order By :

Where Clause :

Searchable? : ☒

Organization Codes

Branch : Division : District :

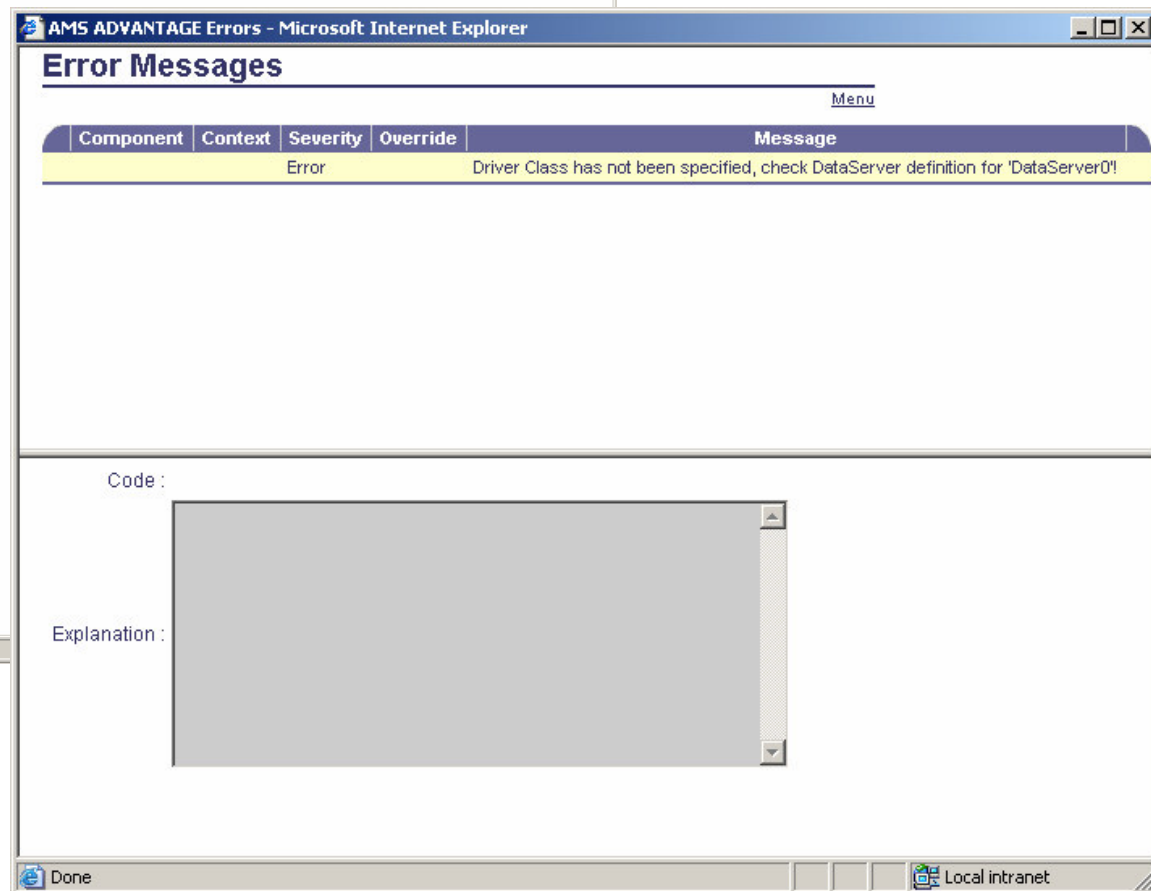
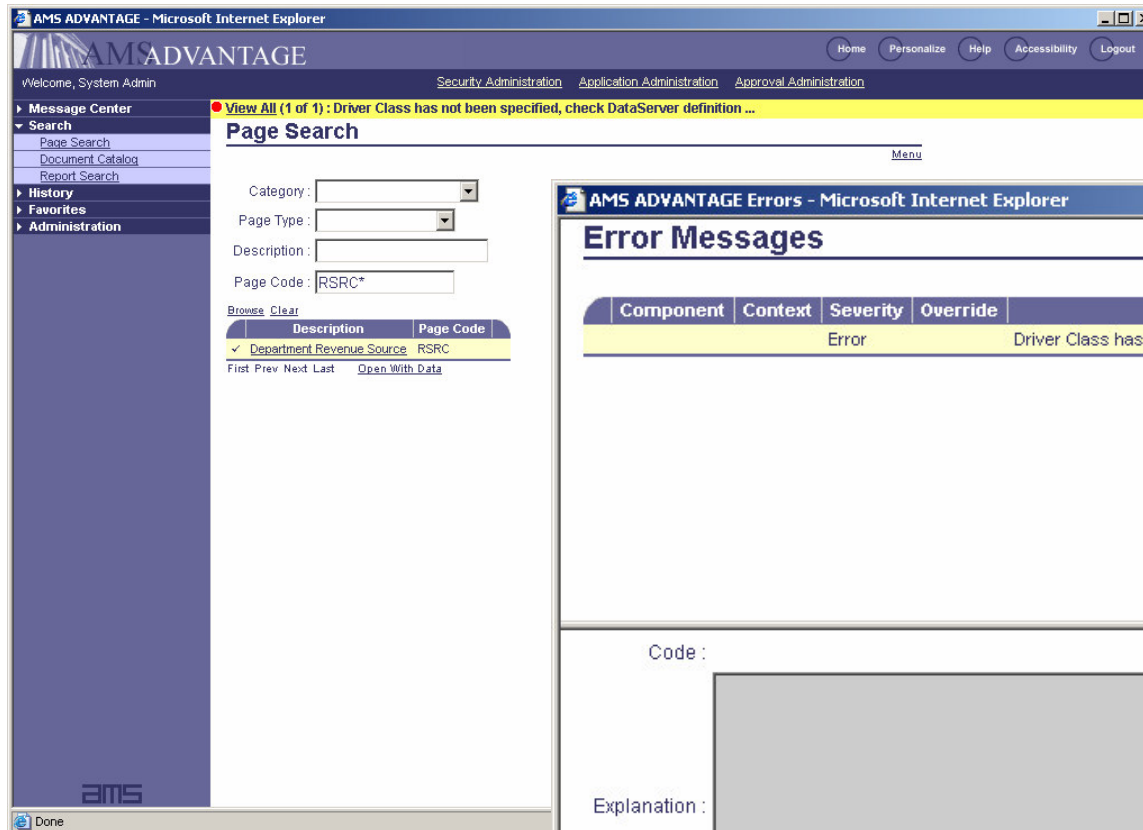
Cabinet : Group : Bureau :

Department : Section : Unit :

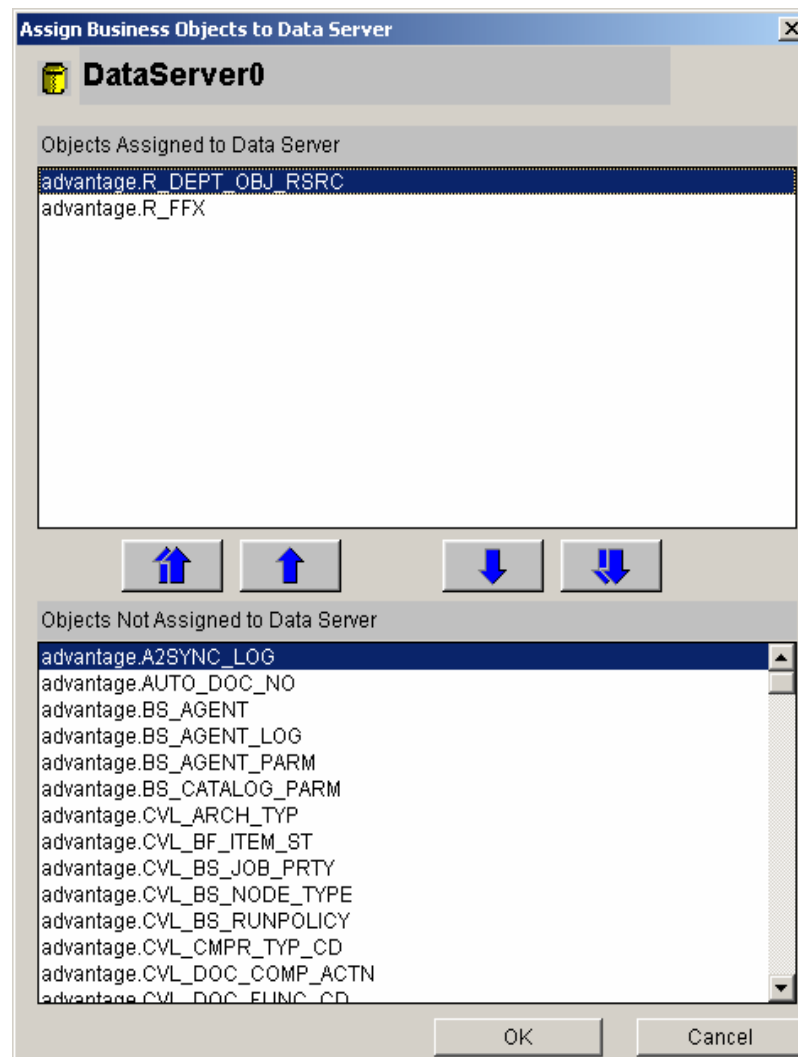
Break



Possible errors



Possible errors



Possible errors

AMS ADVANTAGE - Microsoft Internet Explorer

AMS ADVANTAGE

Welcome, System Admin

Security Administration Application Administration Approval Administration

Message Center

Search

Page Search

Document Catalog

Report Search

History

Favorites

Administration

View All (1 of 1): table or view does not exist

Page Search

Menu

Category:

Page Type:

Description:

Page Code:

Browse Clear

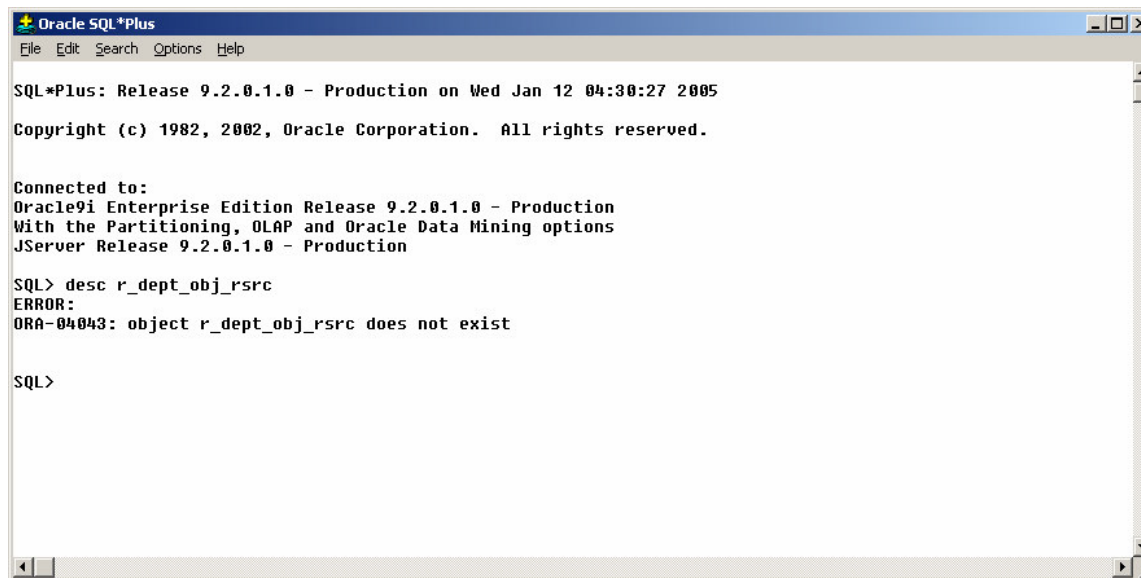
	Description	Page Code
✓	Department Revenue Source	RSRC

First Prev Next Last Open With Data

AMS

Local intranet

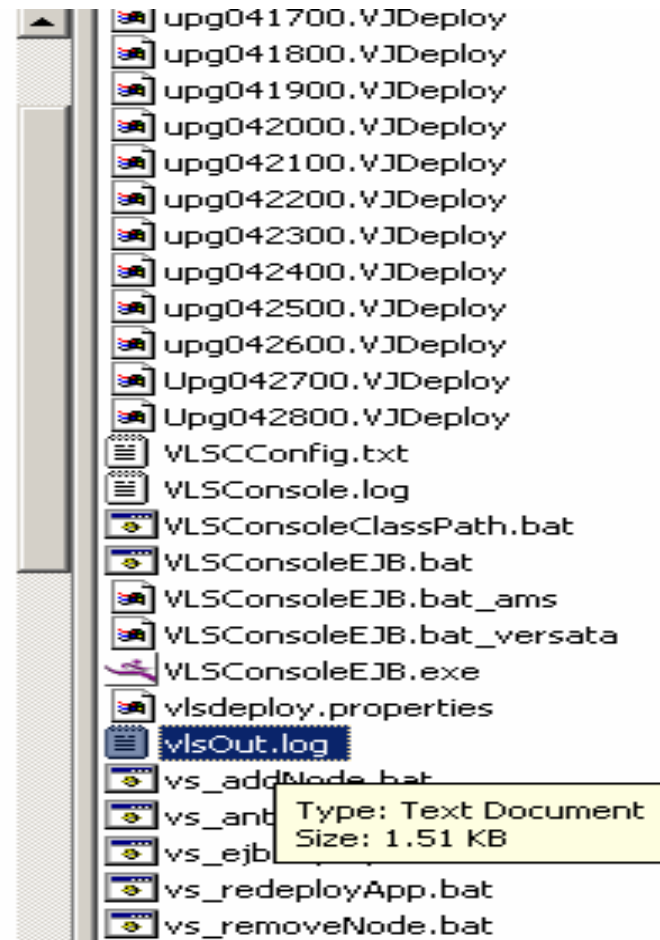
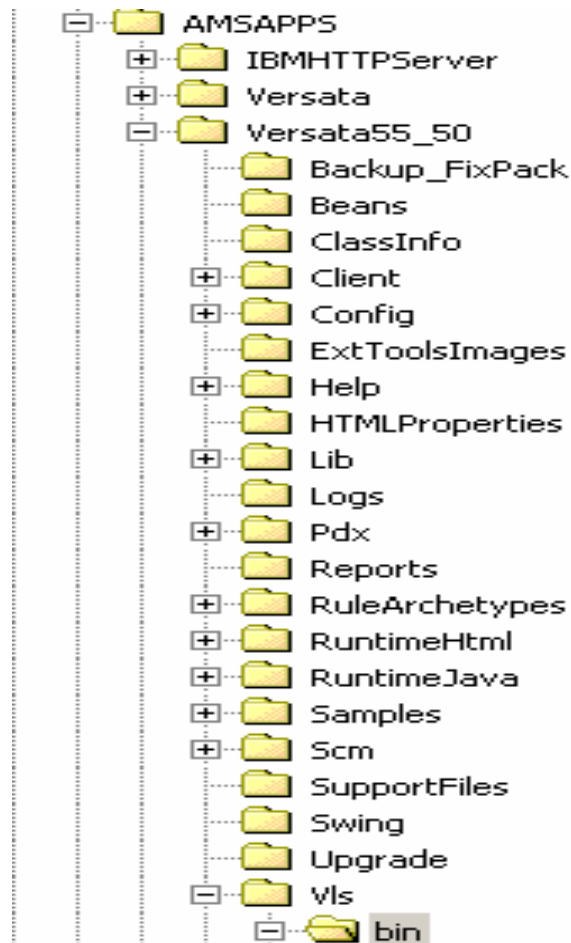
Possible Errors



The screenshot shows a window titled "Oracle SQL*Plus" with a menu bar (File, Edit, Search, Options, Help). The main text area contains the following output:

```
SQL*Plus: Release 9.2.0.1.0 - Production on Wed Jan 12 04:30:27 2005  
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.  
  
Connected to:  
Oracle9i Enterprise Edition Release 9.2.0.1.0 - Production  
With the Partitioning, OLAP and Oracle Data Mining options  
JServer Release 9.2.0.1.0 - Production  
  
SQL> desc r_dept_obj_rsrc  
ERROR:  
ORA-04043: object r_dept_obj_rsrc does not exist  
  
SQL>
```


Vlsout.log



Changes in 3.4

- Location of the vlsout.log has changed
 - From C:\AMSAPPS\Versata55_50\Vls\bin
 - To C:\AMSAPPS\Versata56_51\Vls\logs

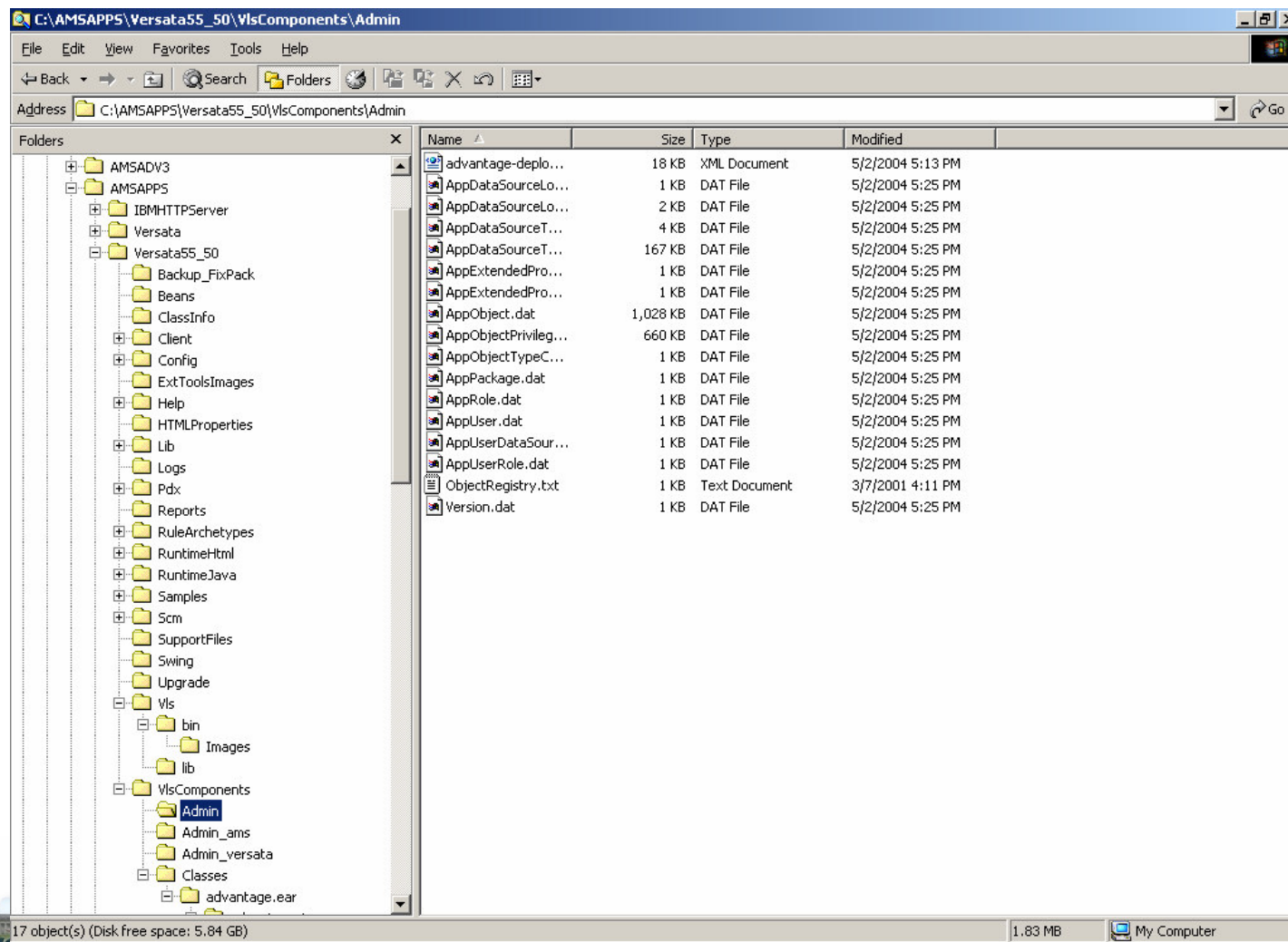
VLSConsole Trace

The screenshot displays the Versata Logic Server Console interface. On the left, a tree view shows the server structure: Versata Logic Server > BGOMOLKA-052393 > Administration (Ver. 60) > Users. The 'sa' user is selected. On the right, the 'Trace user activity' checkbox is checked. Below it are buttons for 'Clear', 'Filter', and 'Save event log'. A table displays the trace results:

Date	Time	Title
1/12/05	5:55:01 AM	(1 select count(*) from training.IN_PAGES
1/12/05	5:55:00 AM	(1 select PAGE_CD, CAT_CD, PAGE_TYP_CD, PAG

Below the table is a 'Details:' section with a large empty text area.

VlsConsole Properties



Deployment to Server



Deployment process

- Once the code has been compiled on the development machine, it might need to be moved to the server
- If the code is only on the development machine, only that one developer can use it
- The application server does not have Versata
- Transfer the file to the specific environment where the code will be tested before moving into production
- Must be done manually

Structure of the Server

- Solaris server
- /opt/AMSADV3/VLSEnv/dev
 - VlsComponents
 - Admin
 - Classes
 - Advantage_dev.ear
 - » Advantage.jar – vls class files
 - » Advantage.war – htm files
 - » Advantage_Web.jar – page class files
- Mirrors the AMSAPPS folder on the development machine

Structure of the Server

- Several different ways to transfer the files
 - Deploy entire advantage.jar to the server
 - Run an update jar command on unix
 - Change Websphere setting to allow for just deploying specific class files into the jar

Structure of the Server

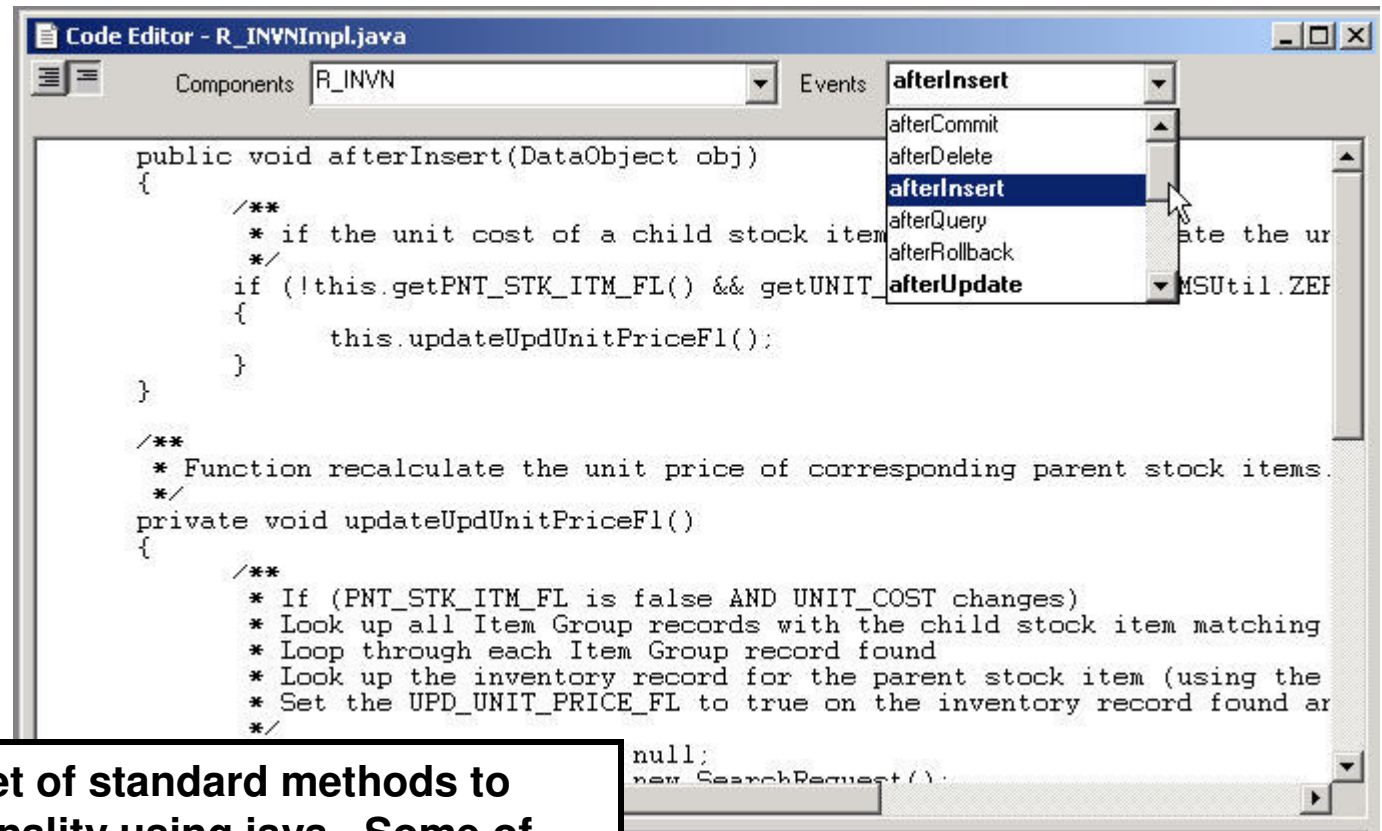
- Advantage.war – htm files
 - Can deploy specific htm files that have changed
- Advantage_Web.jar – page class files
- Advantage.jar – vls class files
 - Need to unjar the file first, then put in updated file, then jar it up again

Code Customization



Custom Code Methods

Custom code for data objects should only be added in the Impl.java file.



```
Code Editor - R_INVNImpl.java
Components R_INVN Events afterInsert
afterCommit
afterDelete
afterInsert
afterQuery
afterRollback
afterUpdate
MSUtil.ZEP

public void afterInsert(DataObject obj)
{
    /**
     * if the unit cost of a child stock item
     */
    if (!this.getPNT_STK_ITM_FL() && getUNIT_COST_FL())
    {
        this.updateUpdUnitPriceFl();
    }
}

/**
 * Function recalculate the unit price of corresponding parent stock items.
 */
private void updateUpdUnitPriceFl()
{
    /**
     * If (PNT_STK_ITM_FL is false AND UNIT_COST changes)
     * Look up all Item Group records with the child stock item matching
     * Loop through each Item Group record found
     * Look up the inventory record for the parent stock item (using the
     * Set the UPD_UNIT_PRICE_FL to true on the inventory record found as
     */
    null;
    new SearchRequest();
}
```

Versata provides a set of standard methods to allow custom functionality using java. Some of these methods include: beforeInsert, beforeUpdate, afterInsert, afterUpdate, beforeCommit, beforeDelete...

Custom Code Methods

Within these Versata provided custom methods, user defined custom methods can be called. This is where a large part of table and document functionality is enforced.

Below it shows a custom method `updateUpdUnitPriceFl` being called from `afterInsert`.

```
public void afterInsert(DataObject obj)
{
    /**
     * if the unit cost of a child stock item changes, recalculate the unit price of
     */
    if (!this.getPNT_STK_ITM_FL() && getUNIT_COST().compareTo(AMStringUtil.ZERO) != 0)
    {
        this.updateUpdUnitPriceFl();
    }
}

/**
 * Function recalculate the unit price of corresponding parent stock items.
 */
private void updateUpdUnitPriceFl()
{
}
```

Before adding custom code it is important to understand the order of operations that are carried out in the business object. This defines when the

Method Common Uses

- beforeInsert/beforeUpdate
 - Custom inference logic
 - Error checking/Raising exceptions

```
//{{COMP_EVENT_beforeUpdate
public void beforeUpdate(DataObject obj, Response response)
{
    commonBeforeLogic();
}
```

```
//{{COMP_EVENT_beforeInsert
public void beforeInsert(DataObject obj, Response response)
{
    // If STK_COMM_CD is not null then concat StkComm with CdSfx
    if(!this.isNull("STK_COMM_CD"))
    {
        this.setSTK_ITM(this.concatStkCommCdSfx(this.getSTK_COMM_CD(), this.getSTK_ITM_SFX()));
    }
    // If STK_ITM_DSCR is blank, invoke logic to infer value from the commodity description
    if(this.isNull("STK_ITM_DSCR"))
    {
        R_COMM_CDImpl loR_COMM_CD= getCommCdToInvn();
        if(loR_COMM_CD != null)
        {
            this.setSTK_ITM_DSCR(loR_COMM_CD.getCOMM_DSCR());
        }
    }
}
```

Method Common Uses

- afterInsert/afterUpdate
 - Performs updates to attributes
 - Perform updates to other objects
 - Final error checks/raising exceptions

```
//{{COMP_EVENT_afterUpdate
public void afterUpdate(DataObject obj)
{
    // Issue error if there are no accounting lines for this document.
    if( (this.getDOC_ACTN_CD() == AMSCommonConstants.DOC_ACTN_VALIDATE ||
        this.getDOC_ACTN_CD() == AMSCommonConstants.DOC_ACTN_SUBMIT)
        && this.getTOT_ACTG_LN_CT() == 0 )
    {
        raiseException("%c:A1627%");
    }
}
```

```
//{{COMP_EVENT_afterUpdate
public void afterUpdate(DataObject obj)
{
    /**
     * if the unit cost of a child stock item changes, recalculate the unit price of corresponding parent
     * stock items
     */
    if (!this.getPNT_STK_ITM_FL() && this.getUNIT_COST().compareTo(this.getOldUNIT_COST()) != 0 )
    {
        this.updateUpdUnitPriceFl();
    }
}
```

Developers Guide

Refer to the developers guide for details on coding standards.

AMS ADVANTAGE® Financial Developer's User Guide



+	What is AMS ADVANTAGE® Financial?
+	AMS ADVANTAGE Technical and Application Architecture
+	Basics of the AMS ADVANTAGE® Studio
+	AMS ADVANTAGE® Technical Architecture
+	Server Layer Infrastructure
+	AMS ADVANTAGE® Documents
+	XML Export and Import
+	AMS ADVANTAGE® Job Framework
+	AMS ADVANTAGE® Standard Report Framework
+	AMS ADVANTAGE® Forms Printing
+	Application Data Entry Usability Features
+	Optimistic and Pessimistic Database Locking
+	Memory Resident Tables (MRT)
+	Server Data Object Caching (SDO)
+	Database Access Usability and Guidelines
+	General Performance Considerations
	AMS ADVANTAGE® Application Architecture
+	Common Application Toolkit and Services
+	Helper Classes and Utilities
+	Writing Reference Table Data Object Custom Code
+	Posting Engines
+	Documents
+	Creating Application Pages
+	Using Batch and Report Architecture
+	AMS ADVANTAGE Coding Standards
+	Why Have Code Conventions
	Java Source Files
	Beginning Comments
	Package and Import Statements
+	Class and Interface Declarations

Infrastructure Classes

AMS ADVANTAGE® 3
Application Development

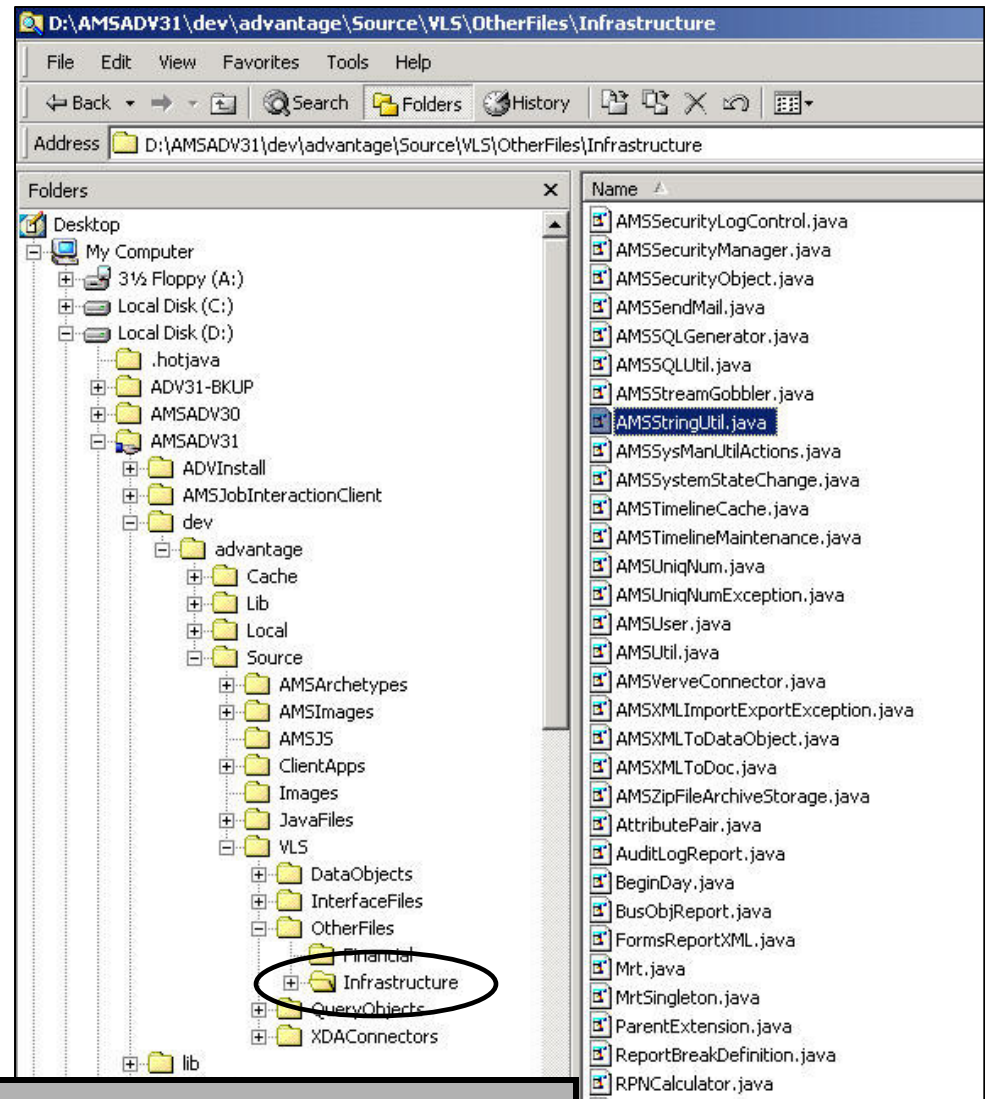


Infrastructure Classes

Infrastructure provides classes that are used to support developers. These methods can be called from custom code, conditional actions, and constraints.

These files can be found in:

\\AMSADV3\dev\advantage\Source\VLS\OtherFiles\Infrastructure



AMSCCommonConstants

This class only contains constants defined for the system. These include Document Function codes, Document Phase codes, Document Status Codes, and many more. It is recommended that the constants value are used in place of the integer values when coding.

```
/**
 * Constants representing document functions
 * The document functions are: NEW, MODIFICATION, CANCELLATION
 */
public static final int      DOC_FUNC_NEW           = 1;
public static final int      DOC_FUNC_MODIFIED      = 2;
public static final int      DOC_FUNC_CANCELED      = 3;

/**
 * Constants representing document sub-functions
 */
public static final int      DOC_S_FUNC_ONLINE      = 1;
public static final int      DOC_S_FUNC_BATCH       = 2;

/**
 * Constants representing document phases
 * The document phases are: NONE, DRAFT, PENDING, FINAL,
 * HISTORICAL PENDING, HISTORICAL FINAL, CONFLICT DRAFT,
 * and TEMPLATE
 */
public static final int      DOC_PHASE_NONE         = 0;
public static final int      DOC_PHASE_DRAFT        = 1;
public static final int      DOC_PHASE_PENDING      = 2;
public static final int      DOC_PHASE_FINAL        = 3;
public static final int      DOC_PHASE_HIST_FINAL   = 5;
public static final int      DOC_PHASE_CONFLICT_DRAFT = 6;
public static final int      DOC_PHASE_TEMPLATE     = 7;

/**
 * Constants representing document status codes
 * The document status codes are: HELD, READY, REJECTED, PROCESSED
 */
public static final int      DOC_STA_CD_HELD        = 1;
public static final int      DOC_STA_CD_READY       = 2;
public static final int      DOC_STA_CD_REJECTED    = 3;
public static final int      DOC_STA_CD_PROCESSED    = 4;

/**
 * Constants representing document modification indicators
 */
public static final int      DOC_COMP_MOD_FL_NEW    = 0;
public static final int      DOC_COMP_MOD_FL_UNCHANGED = 1;
public static final int      DOC_COMP_MOD_FL_CHANGED = 2;
```

\\AMSADV3\dev\advantage\Source\VLS\OtherFiles\Infrastructure\AMSCCommonConstants.java

AMSSStringUtil

**Helper class dealing with strings.
Has methods available for
comparisons, length, trims,
concatenations, and many more.**

Some methods include:

```
public static boolean strEqual( String fs1, String fs2 )
public static boolean strInsensitiveEqual( String fs1, String fs2 )
public static int strCompare( String fs1, String fs2 )
public static int strLen( String fs )
public static String strConcat( String fs1, String fs2 )
```

```
16 package advantage;
17
18 import java.lang.*;
19 import java.util.*;
20 import java.math.*;
21 import versata.common.*;
22
23 /**
24  * Miscellaneous String utilities for use from BRD
25  */
26 public class AMSSStringUtil
27 {
28     public static final int STR_EQ    = 0;
29     public static final int STR_LT    = -1;
30     public static final int STR_GT    = +1;
31     public static final int STR_NULL = -99;
32     public static final String BLANK23 = "          ";
33     public static final String BLANK11 = "          ";
34
35     public static boolean strEqual( String fs1, String fs2, boolean fboolNullStrEq )
36     {
37         if( fboolNullStrEq && fs1 == null && fs2 == null )
38         {
39             return true;
40         }
41         return strEqual(fs1, fs2);
42     }
43
44     public static boolean strEqual( String fs1, String fs2 )
45     {
46         if( fs1 == null || fs2 == null )
47         {
48             return false;
49         }
50         return strCompare(fs1, fs2) == STR_EQ;
51     }
52
53     public static boolean strEqual( String fs1, int fiStart, int fiLen, String fs2 )
54     {
55         if( fs1 == null || fs2 == null )
```

\\AMSADV3\dev\advantage\Source\VLS\OtherFiles\Infrastructure\AMSSStringUtil.java

Debugging

AMS ADVANTAGE[®] 3
Application Development



Debugging

- Several common problems that appear
- Certain places give more information about errors
 - vlsOut.log
 - VLS Console

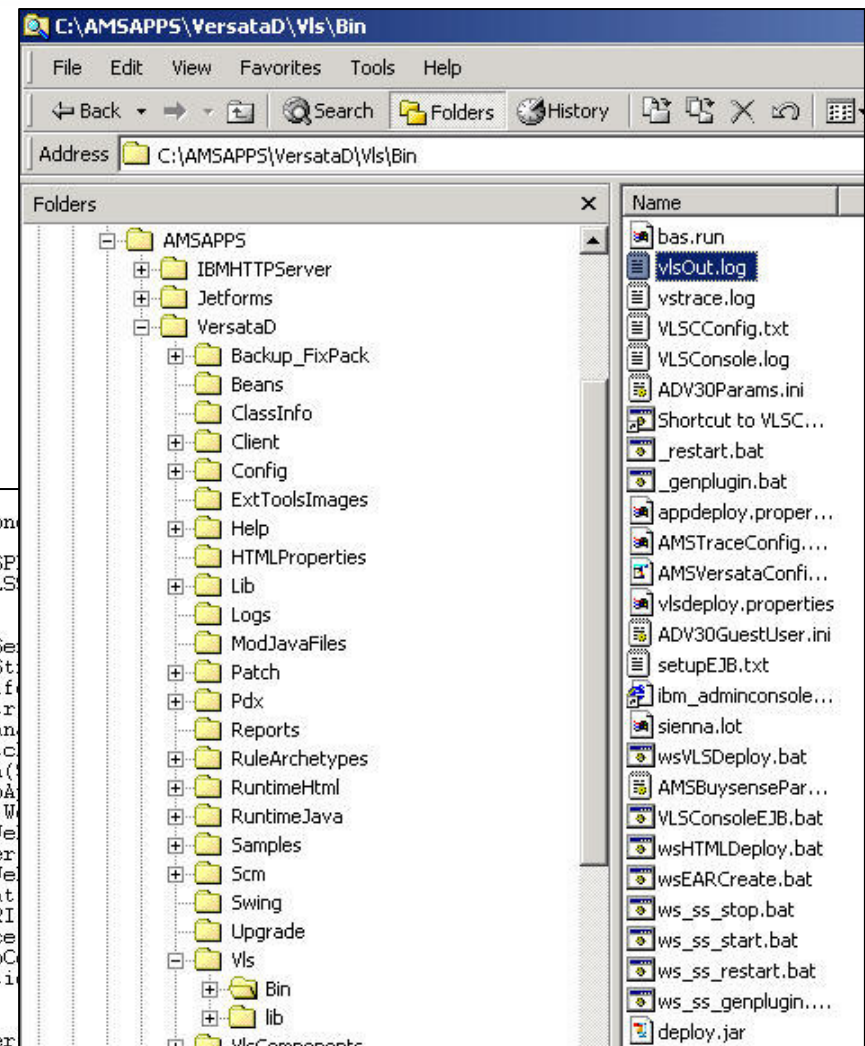
vlsOut.log

vlsOut.log records output from the application – null pointers, etc.

```

1 PLSServlet loading: versata.vfc.html.servlet.SessionTrackingInternal
2 PLSServlet: starting the SessionCacheSweepThread; sweeping every: 600 second
3 java.lang.NullPointerException
4     at com.amsinc.gems.adv.vfc.html.servlet.AMSPLSServlet.doAction(AMSP
5     at com.amsinc.gems.adv.vfc.html.servlet.AMSPLSServlet.doPost(AMSP
6     at javax.servlet.http.HttpServlet.service(HttpServlet.java:760)
7     at javax.servlet.http.HttpServlet.service(HttpServlet.java:853)
8     at com.ibm.servlet.engine.webapp.StrictServletInstance.doService(Ser
9     at com.ibm.servlet.engine.webapp.StrictLifecycleServlet._service(St
10    at com.ibm.servlet.engine.webapp.IdleServletState.service(StrictLif
11    at com.ibm.servlet.engine.webapp.StrictLifecycleServlet.service(Str
12    at com.ibm.servlet.engine.webapp.ServletInstance.service(ServletMan
13    at com.ibm.servlet.engine.webapp.ValidServletReferenceState.dispatch
14    at com.ibm.servlet.engine.webapp.ServletInstanceReference.dispatch(
15    at com.ibm.servlet.engine.webapp.WebAppRequestDispatcher.handleWebA
16    at com.ibm.servlet.engine.webapp.WebAppRequestDispatcher.dispatch(W
17    at com.ibm.servlet.engine.webapp.WebAppRequestDispatcher.forward(We
18    at com.ibm.servlet.engine.srt.WebAppInvoker.doForward(WebAppInvoker
19    at com.ibm.servlet.engine.srt.WebAppInvoker.handleInvocationHook(We
20    at com.ibm.servlet.engine.invocation.CachedInvocation.handleInvocat
21    at com.ibm.servlet.engine.srp.ServletRequestProcessor.dispatchByURI
22    at com.ibm.servlet.engine.osel.listener.OSELListenerDispatcher.service
23    at com.ibm.servlet.engine.http11.HttpConnection.handleRequest(HttpC
24    at com.ibm.ws.http.HttpConnection.readAndHandleRequest(HttpConnecti
25    at com.ibm.ws.http.HttpConnection.run(HttpConnection.java:252)
26    at com.ibm.ws.util.CachedThread.run(ThreadPool.java:137)
27 AMSLog4JConfigurator - using config file name"/D:/AMSADV31/lib/log4j.proper
28 AMSLog4JConfigurator - delay set to 180000 milliseconds.
29 Loaded VSTrace subsystem v1.0
30 VSTrace disabled. To enable, add vst_ison=on to C:\AMSAPPS\VersataD\VLS\bin\vstrace.properties
31 RT11433: Tier Limit: VLS license = Developer license
32 *****
33 INFO: Loaded App properties for: Advantage

```



\\AMSAPPS\VersataD\VLS\Bin

Debugging

Code:

```
someMethod()  
{  
    String lsString1 = "Versata";  
    System.err.println( "Value of lsString1 = " + lsString1 );  
}
```

vlsOut.log:

```
59 Created Text Document  
60 RT11854: ***** local get called *****  
61 RT11854: ***** local get called *****  
62 RT11854: ***** local get called *****  
63 RT11854: ***** local get called *****  
64 Value of lsString1 = Versata  
65
```

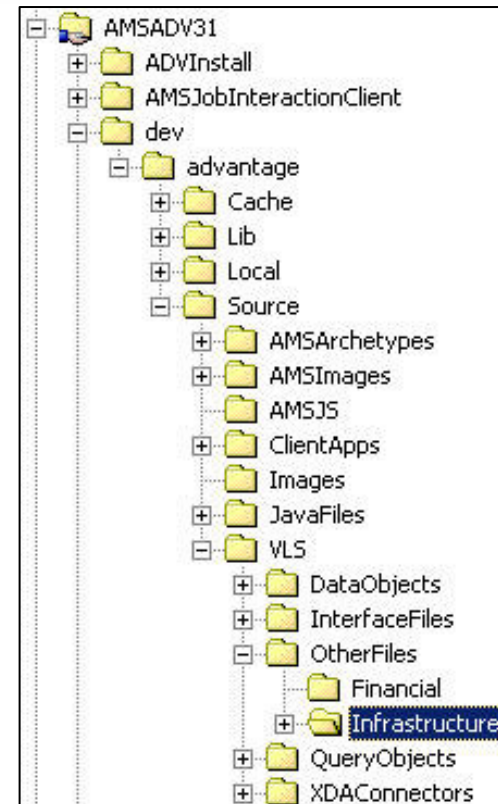
vlsOut.log also records any system println statements. Putting these statements inside code is an easy way to debug.

AMS Debug

Infrastructure provides some debug capabilities by setting the AMS_Debug constant in AMSDataObject.java to true.

By turning AMS Debug on, it prints informational statements to the vlsOut.log.

Once this value is updated, AMSDataObject must be recompiled, deployed, and the server restarted.



```
public class AMSDataObject extends versata.vls.DataObject
implements AMSCommonConstants, IVSTraceVocab
{
    //
    // Constants
    //
    public static final boolean AMS_DEBUG = false;
```

\\AMSADV3\dev\advantage\Source\VLS\OtherFiles\Infrastructure\AMSDataObject.java

VLS Console

The screenshot displays the Versata Logic Server Console. On the left, a tree view shows the hierarchy: Versata Logic Server > npowers-24557 > Administration (Ver. 57) > Monitor > Performance > User Sessions. The 'User Sessions' folder is expanded, showing a session for 'sa'. A callout box labeled 'Sessions' points to this session. The main pane on the right is titled 'Trace activity' and contains a checkbox for 'Trace user activity' which is checked. Below this are buttons for 'Clear', 'Filter', and 'Save event log'. A table lists activity entries with columns for Date, Time, and Title. A callout box labeled 'SQL, Info Statements, Errors' points to the 'Title' column. The table shows several entries for 1/30/03 at 2:50:35 PM and 2:50:38 PM. The last entry is selected, and its details are shown in a text area below the table. A callout box labeled 'Expanded SQL Statements' points to this details area.

Date	Time	Title
1/30/03	2:50:51 PM	(1 select DOC_FUNC_CD, DOC_FUNC_NM, AMS_ROW
1/30/03	2:50:51 PM	(1 RT11611: Cache Request: CVL_DOC_FUNC_CD
1/30/03	2:50:46 PM	(1 select count(*) from npowers.IN_PAGES w
1/30/03	2:50:46 PM	(1 select PAGE_CD, CAT_CD, PAGE_TYP_CD,
1/30/03	2:50:38 PM	(1 select PAGE_CD, CAT_CD, PAGE_TYP_CD,
1/30/03	2:50:38 PM	(1 select count(*) from npowers.R_ABC
1/30/03	2:50:38 PM	(1 select DEPT_CD, UNIT_CD, ABC_CLS, ABC
1/30/03	2:50:35 PM	(1 select PAGE_CD, CAT_CD, PAGE_TYP_CD, PAG
1/30/03	2:50:35 PM	(1 select count(*) from npowers.IN_PAGES w
1/30/03	2:50:35 PM	(1 select PAGE_CD, CAT_CD, PAGE_TYP_CD, PAG

Details:

```
select PAGE_CD, CAT_CD, PAGE_TYP_CD, PAGE_DESC, APPL_NM, DEST_PG,
DEST_FRAMESET, DEST_FRAME, TARGET_FRAME, MODE_IND,
WHERE_CLAUSE, ORDER_BY, HLP_SUB_DIR, HLP_FILE_NM,
AMS_ROW_VERS_NO, PG_SHW_FL, BRN_CD, CAB_CD, DEPT_CD, DIV_CD,
GP_CD, SECT_CD, DSTC_CD, BUR_CD, UNIT_CD, PAGE_DESC_UP,
APPL_NM_UP, DEST_PG_UP, APPL_ID from npowers.IN_PAGES where ((
PG_SHW_FL = 1 ) AND ( APPL_ID IN (0,1,2,6) )) ORDER BY
IN_PAGES.PAGE_CD
```

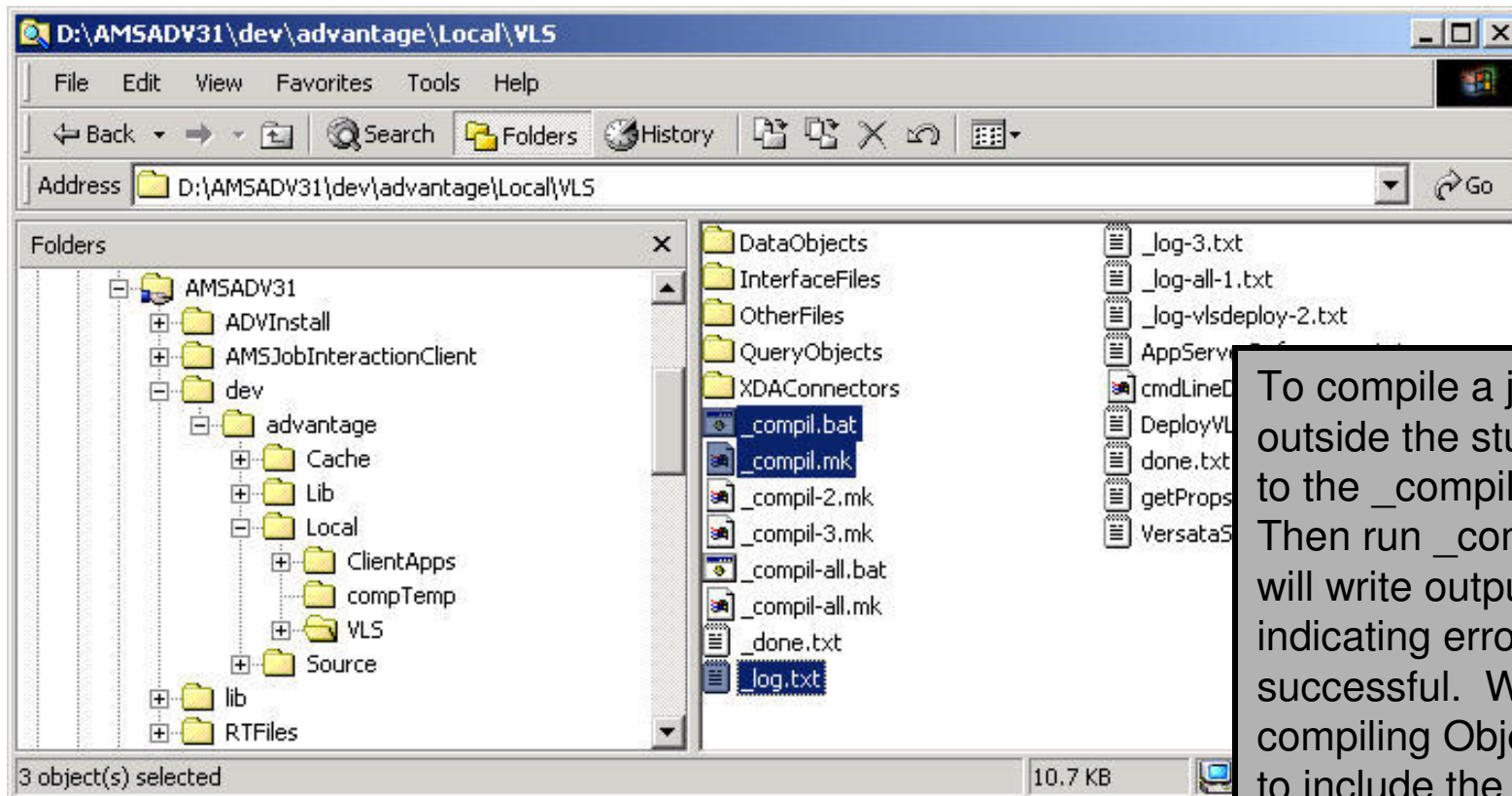
The VLS Console can be used to view SQL statements being run against the database. It also logs errors and informational statements. These are stored by session. Error is usually in the last statement of VLS console.

Working Outside the Studio

AMS ADVANTAGE® 3
Application Development



Compiling Java Files



To compile a java file outside the studio, add files to the `_compil.mk` file. Then run `_compil.bat`. This will write output to `_log.txt` indicating errors or if it was successful. When compiling Objects, be sure to include the Impl AND BaseImpl files.

`_log.txt`

```
[loading C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar(java/lang/IllegalAccessError.class)]
[loading C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar(java/lang/NoClassDefFoundError.class)]
[loading C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar(java/lang/LinkageError.class)]
[loading C:\AMSAPPS\WEBSPH~1\APPSER~1\java\jre\lib\rt.jar(java/lang/StringBuffer.class)]
[wrote C:\AMSADV31\dev\ADVANT~1\Lib\VLS\advantage\R_TESTBaseImpl.class]
[total 2824ms]
```

`_compil.mk`

```
1 C:\AMSADV31\dev\ADVANTAGE\Source\VLS\DATAOBJECTS\FINANCIAL\<APPLICATION>\R_DATAOBJECTImpl.java
2 C:\AMSADV31\dev\ADVANTAGE\Cache\VLS\DATAOBJECTS\FINANCIAL\<APPLICATION>\R_DATAOBJECTBaseImpl.java
3
```

Customizations

- Client site customizations
- Various needs
- Customizations not baselined
- Reapplied to new application version

Customizations

- Important to keep copy of original file (PVCS, Development Spreadsheet)
- What files modified for specific customization
- Mark customizations for ease for future integration

Development Tracking Spreadsheet

- Used to track all development activity (custom mod, on-site issue fix, patch)
- Very helpful when reapplying custom mods

Microsoft Excel - Development_Tracking_Wyoming.xls

File Edit View Insert Format Tools Data Window Help

SnagIt Window

117

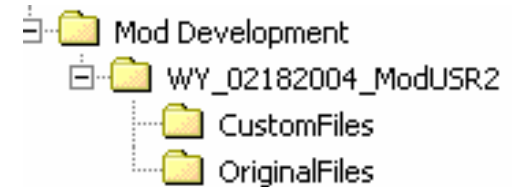
	A	B	C	D	E	F	G	H	I
	Folder Name	Tracking Number	Type	Status	Description	DEV	SYSTEST	PROD	Affected Files (SF - Source File, EF - Executable File, RF - Rebuild New File)
14	WVY_02182004_ModUSR2	MOD 1	Custom Mod	In Progress	User Defined Page (USR2)	2/19/2004			1. (N) WY_USR2.xml - SF (in HR_ClientCustomDataObject) 2. (N) WY_USR2BaseImpl.java - RF (in HR_ClientCustomDataObject) 3. (N) WY_USR2BaseImpl.class - EF (in advantage.jar) 4. (N) WY_USR2Impl.java - SF (in HR_ClientCustomDataObject) 5. (N) WY_USR2Impl.class - EF (in advantage.jar) 6. (N) REL_EMPL-WY_USR2 - SF (in EmployeeProfileManagement) 7. EMPLBaseImpl.java - RF (in EmployeeProfileManagement) 8. EMPLBaseImpl.class - EF (in advantage.jar) 9. (N) pWY_USR2.xml - SF (in HR_EmployeeProfileManagement) 10. (N) pWY_USR2.java - SF (in HR_EmployeeProfileManagement) 11. (N) pWY_USR2Base.java - RF (in HR_EmployeeProfileManagement) 12. (N) pWY_USR2.class - EF (in HR_EmployeeProfileManagement) 13. (N) pWY_USR2Base.class - EF (in HR_EmployeeProfileManagement) 14. (N) pWY_USR2.htm - SF,RF,EF (in HR_EmployeeProfileManagement)

Development Tracking Spreadsheet

- Folder Name
- Tracking Number
- Type
 - Custom Mod, On-Site Issue Fix, Patch
- Status
 - Not Started, In Progress, Ready for SYSTEST Migration, In SYSTEST, Ready for PROD Migration, In PROD, Baselined
- Description
- Environment Dates
 - Date mod deployed to the following environments:
Development, SYSTEST, PROD
- Affected Files **(Most Critical Entry)**
 - - List of all affected files including source files, rebuilt files, executable files (+ any db script included here)

Original Files vs Custom Files

- Every mod has main folder
 - 2 folders under main folder
 - 1. Original Files
 - Baseline file or latest version of modified file
 - Copy file (“Check out”) from Build machine repository (or “CVS” in the future) to Local Machine (where development will be done)
 - 2. Custom Files
 - Modified files
 - Folders Maintained on Build Machine
(under <Site Name> Custom folder)



Commenting Code

- Certain module's can be marked or commented, allowing developers to identify customization (helpful when reapplying changes to new software release)
- What types of modules can not be marked?
 - *.xml
 - *Base*.java (any generated java)
 - Generated HTML
- What types of modules can be marked?
 - *Impl.java
 - *.java (Other Files)
 - Custom HTML

Commenting Code - Examples

■ Java

- Add `//comment` or `/**...*/` for comment blocks

```
//Begin Modification for Olmsted

/**
 * The following code has been added to print vendor name instead of vendor code on the stub
 * If name on check option is Legal, Vendor Legal Name will be printed
 * If name on check option is Alias/DBA, Vendor Alias Name will be printed
 * If name on check option is Both, Vendor Legal Name will be printed
 */

// The following line is commented out to print payee name instead of payee code
//lsPayeeCode = loVendorObjHandle.getData("VEND_CUST_CD").getString();

int liCheckName = getCheckNameValFromVendor(loVendorObjHandle.getData("VEND_CUST_CD").getString());
```

■ HTML

- Add `<!-- comment -->`
- Important to note that when pages are rebuilt, all HTML customizations are lost.

```
<!-- WYOMING MOD (Add transition to USR2) -->
<a name="btnT5pWY_USR2" href="HR_EmployeeProfileManagement" id="btnT5pWY_USR2"
    vsds="rs01QRY_EMPLOYEE_ASGNMT_AF"
    vsnavigation="T5pWY_USR2">Go to Performance Appraisals (USR2)</a>
```

Customizations

- Grid customization example
 - Add fields to grid portion



Customizations

- Original Grid

| Accounting Line | Posting Code | Debit Amount | Credit Amount |

Insert New Line Insert Copied Line

- Customized Grid

| Line | PC | Fund | Dept | Unit | Rev | Objt | BSA | Debit | Credit |

Insert New Line Insert Copied Line

Customizations

- Edit .htm file for the application page
- Find references to the Grid and make changes as necessary
- Mark customizations with tags

Customizations

```
<!--BGN Customization-->
```



3 Types of HTML Customizations

- CLIENT XML customization - HTML has been rebuilt and is now customized because of either a Data Object XML change (i.e. labels) or a page XML change (i.e. choosing which fields to display, archetypes, etc..). The HTML has been rebuilt to incorporate these changes.
- CLIENT HTML customization – HTML has been modified directly without changing the page XML. Not recommended because there usually is a way to do it in XML and then rebuild your page to incorporate the customization.
- BASELINE HTML customization - This is where CGI-AMS has had to make a customization to the HTML AFTER the page was rebuilt. You will usually find these marked with a tag to easily identify the customization (i.e. action codes hyperlinks). Comparing the HTML after a Rebuild to the Baseline version is extremely complicated.

Customization Example

- Scenario: Upgrading from 3.2 to 3.3, and there have been customizations made to 3.2 (3.2.custom)



Customization Example

1. Save off any of the 3.3 baseline affected files (page XML and HTML in this case) to some Original Files folder (e.g. Client Mods/ 3.3/Mod1/OriginalFiles)
2. You should also have a saved off copy of the 3.2 versions (both the original and custom versions).
3. Take the 3.3. page XML and apply changes that have been applied to the 3.2 custom page XML. You could do a compare between the 3.2 version Original vs Custom to identify exactly what has changed. If you compare the 3.3. baseline to the 3.2 custom then you may see some other changes that aren't related to the mod, this is why we want to create these Original and Custom folders for every release, and also keep track with the Development Tracking Spreadsheet to identify exactly what was changed.
4. Rebuild the 3.3 html
5. You should know (from the documentation, or from having done this in the previous release) if there were any "BASELINE HTML" customizations that would need to be reapplied.
 - a. If there were NOT any "BASELINE HTML" or "CLIENT HTML" customizations - then after doing your rebuild you are done. No need to reapply any HTML customizations.
 - b. If there were "BASELINE HTML" customizations - then there are a couple extra steps. You still need to do your rebuild to incorporate the changes...but upon doing so you will have lost PE's Baseline custom HTML.
 - b.1 - Since you have the 3.3. original baseline saved off - you can do a Beyond Compare between the 2 files, if the change is obvious then you can just bring it over from the original to the latest one.

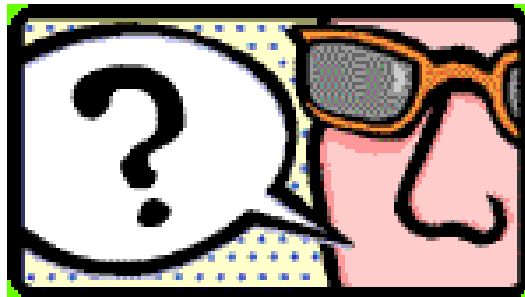
Key Step to Customizations

- DOCUMENTATION!!!
- Make sure that everything is documented very precisely
- Recommend some sort of tracking procedure such as the Development Tracking Spreadsheet (each mod or patch has an entry in this spreadsheet with affected files, description of the change, dates, etc...)

Patch Files

	Patch File	Rebuild?	Recompile?
Dataobject	xml	X	X
	impl.java		X
Queryobject	xml	X	X
	impl.java		X
HTML	xml	X	X
	java		X
	html		

Questions!



Error Messages

AMS ADVANTAGE® 3
Application Development



Constructing Error Messages

	Feature	Syntax	Notes	R_MSG
Issuing Messages	Command Structure	% ... , ... %	%c:T001,s:I,p:AGENCY_CD%	
	Message Code	c:code		Yes
	Severity	s:severity	I, W, E, S	Yes
	Override Level	o:level	1..10	Yes
	Parameter via Attribute	p:attribute	p:AGENCY_CD	No
	Parameter via Value	v:value	v:Dept Of Trans	No
	Context (table)	d:name	d:GN_AGCY	No
	Context (attribute)	a:name	a:AGCY_CD	No
Designing Messages	Percent Sign	%%	Because %, <, > are reserved symbols, double them to indicate you want to actually use the reserved symbol in your message text.	
	Left Arrow	<<		
	Right Arrow	>>		
	Business Content	<text>	<Agency>	
	Placeholder	%p		

Severity:

I=Informational
W=Warning
E=Error
S=Severe

Override:

Bypassing certain edits based on security level

Value

Parameter:

Allows generic error messages to be customized

Issuing Error Message from Development Studio

Name	Type	Condition
CannotChangePK	Reject/When	(Updating AND (:Old. WHSE_CD <> WHSE_
CannotDelete	Reject/When	(Deleting)
FixSrchrNonNeg	Reject/When	(Inserting OR Updating) AND (PRICE_METH =
FixSrchrNotAlw	Reject/When	(Inserting OR Updating) AND (PRICE_METH
FixSrchrZero	Reject/When	(Inserting OR (Updating AND ((PRICE_ME1
MaxIssQtyNonNeg	Reject/When	(Inserting OR Updating) AND (MAX_ISS_QTY
MaxSrchrNonNeg	Reject/When	(Inserting OR Updating) AND (PRICE_METH
MaxSrchrNotAlw	Reject/When	(Inserting OR Updating) AND (PRICE_METH
MinIssLEMaxIss	Reject/When	(Inserting OR Updating) AND (MIN_ISS_QTY

Constraint Name: MaxIssQtyNonNeg

Condition: (Inserting OR Updating) AND (MAX_ISS_QTY < 0)

☐ Accept When
☒ Reject When

Error Message: %c:A470,v:Maximum Issue Quantity%

Error Attribute: MAX_ISS_QTY

'c:' is for the code that corresponds to a record on the R_MSG table (table that stores error messages).

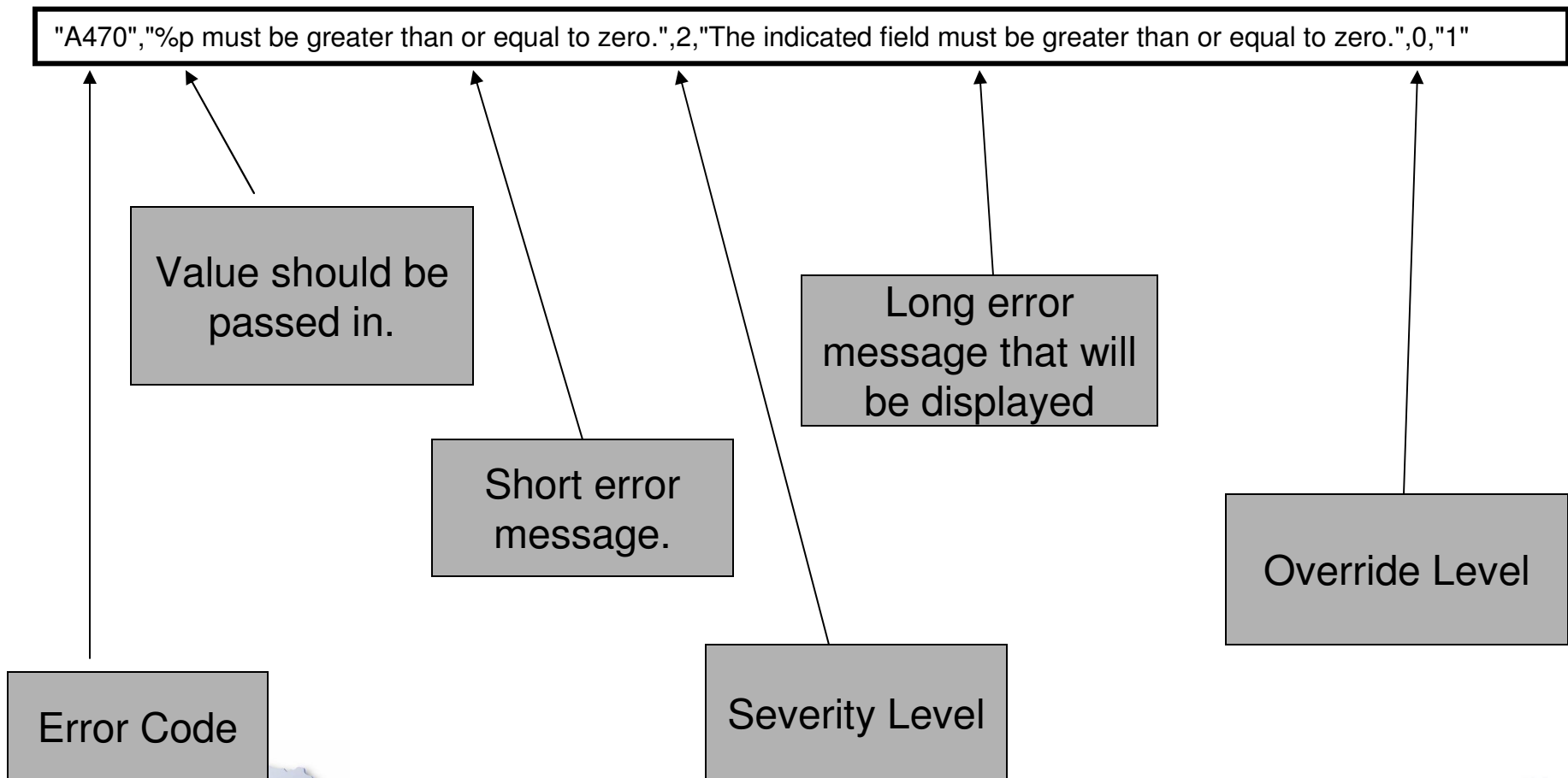
R_MSG is available in the application and must be updated with each new message. The page code is 'MSG'.

Always begin and end with '% '.

v: passes the literal value of the parameter

Error Message %c:A470,v:Maximum Issue Quantity%

Dissecting Error Message, R_MSG Data Entry



Error Message

Severity Code (Uppercase)	Severity Type	When should you use it?
I	Informational errors	This type of severity should be used when you want to display a message to the user but still want to commit data to the database.
E	Error	This type of severity should be used when you want to display validation errors. This severity level will not commit data to the database.
S	Severe - Technical	This type of severity should be used when you want to raise a technical error. This will stop the processing and displays a message to the user. This will not commit data to the database. All the technical errors will be logged in the system

Error Message

```
%c:ErrorCode,s:SeverityLevel,v:Value,p:AttributeName%
```

%.....% - Command structure

c: - Error code assigned when registered in "Reference Data Registration App."

s: - Severity level of the error code

v: - Parameter by value(to replace tokens in the error message)

p: - Parameter by Attribute(for dataobjects)

```
raiseException("%c:TI000001,s:E%")
```

TI000001 – Error code from R_MSG

E - Severity level of error

Error Message

```
raiseException("%c:TI000002,s:E,v:1111111%")
```

TI000002 – Error code from R_MSG

E - Severity level of error

11111111 – Value to be filled in.

A value can be passed where the value of a token is known to replace tokens.

Actual Error message might look like this:

Before:

```
Taxpayer External ID $*$ is invalid
```

After:

```
Taxpayer External ID 11111111 is invalid
```

Error Message

```
raiseException("%c:TI000002,s:E,v:1111111, v:John Doe% ")
```

%c:ErrorCode,s:Severity,v:value1, v:value2,v:...n%

TI000002 – Error code from R_MSG

E - Severity level of error

11111111 – Value to be filled in first token

John Doe – Value to be filled in second token

A value can be passed where the value of a token is known to replace tokens.

Actual Error message might look like this:

Before:

```
Taxpayer External ID $$ is invalid for $$
```

After:

```
Taxpayer External ID 11111111 is invalid for John Doe
```

Error Message

```
raiseException("%c:TI000002,s:E,p:EXTERNAL_ID%")
```

TI000002 – Error code from R_MSG

E - Severity level of error

EXTERNAL_ID – Value to be filled in

An attribute name can be passed from a Dataobject or QueryObject where the value is not known to replace tokens.

Actual Error message might look like this:

Before:

```
Taxpayer External ID $$ is invalid
```

After:

```
Taxpayer External ID 11111111 is invalid
```

Error Message

```
raiseException("%c:TI000003,s:E,p:EXTERNAL_ID,v:John Doe%")
```

TI000003 – Error code from R_MSG

E - Severity level of error

EXTERNAL_ID – Value to be filled in

John Doe – Value to be filled in

Actual Error message might look like this:

Before:

```
External ID $$ and Taxpayer Name $$ is invalid
```

After:

```
External ID 1111111 and Taxpayer Name John Doe is invalid
```


ADVANTAGE Application Error Message

Error Messages

Component	Context	Severity	Override	Message
R_INVN		Error		Minimum Issue Quantity must be greater than or equal to zero. (A470)
R_INVN		Error		Maximum Issue Quantity must be greater than or equal to zero. (A470)

Code : A470
Explanation : The indicated field must be greater than or equal to zero.

Pricing Method : Standard Price with No Surcharge Maximum Surcharge : 0.000000
Unit Price : 6000.000000 Standard Price : 5.000000
Percent Surcharge : 0.00 Maximum Issue : 1.000000
Fixed Surcharge : 0.000000 Minimum Issue : 0.000000

1/2 : Minimum Issue Quantity must be greater than or equal to zero. (A470)

Severity Level

Short Message

Long Message

Passed Literal Value